



United States Department of the Interior  
U.S. Fish and Wildlife Service

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In Reply Refer To:

AESO/SE  
2-21-98-F-209

July 13, 1999

Mr. Ken Anderson  
District Ranger  
Beaver Creek/Sedona Ranger Districts  
P.O. Box 300  
Sedona, Arizona 86339

Dear Mr. Anderson:

This letter amends the May 5, 1998, biological opinion on the Sedona Ecosystem Management Forest Plan Amendment 12 located on the Coconino National Forest. The opinion considered the adverse effects of Amendment 12 on the Mexican spotted owl (*Strix occidentalis lucida*) (MSO). In addition, the opinion provided concurrences with determinations of "may affect, not likely to adversely affect" for the southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle *Haliaeetus leucocephalus*, and Gila trout (*Oncorhynchus gilae*).

#### CONSULTATION HISTORY

The Forest Service contacted the Service's Flagstaff Suboffice on January 12, 1999, to discuss the need for delayed implementation of a portion of term and condition 1.5 of the May 5, 1998, biological opinion. Term and condition 1.5 specifies that a permit system for day use in West Fork Oak Creek be implemented no later than March 1999. The Forest Service requests a postponement of implementation of this portion of term and condition 1.5 until March 2000. During the January 12, 1999, telephone conversation the methods of data collection to be implemented in 1999, to implement term and condition 3.1 were discussed, as well as the applicability of these methods to gathering information on day use in West Fork Oak Creek in 1999. The Service requested specific information in writing and suggested an amendment to the opinion would be the best way to document the change. The Forest Service requested an amendment to the biological opinion on January 13, 1999.

In the request for an amendment to the biological opinion, the Forest Service states concerns about the cost of printing an additional permit for use only in 1999. The Forest Service indicates that overnight camping will be permitted beginning in 2000, thus allowing the use of this same permit to monitor day use in West Fork as well. In the January 13, 1999, request for an amendment, the Forest Service indicates that the use of a new registration box as well as three infrared counters located within the first three miles of West Fork will result in the collection of the information required in term and condition 3.1, thereby meeting the intent of term and

condition 1.5. The Service wishes to clarify that term and condition 3.1 implements a requirement of reasonable and prudent measure 3 which specifies the collection of information on recreational use within the Cave Springs MSO protected activity center (PAC) specifically, whereas, term and condition 1.5 implements reasonable and prudent measure 1 which specifies the minimization of the effects of visitor use to the MSO and its habitat in the entirety of West Fork. The Service does not believe the delay in implementation of term and condition 1.5 for a period of one year changes the effects to MSO, but we wish to clarify that, while collection of visitor information within the first three miles of West Fork will assist to some degree in gathering information on visitor use in West Fork in general, it does not meet the intent of term and condition 1.5 which is to gather information on use within the entirety of West Fork.

#### CONCURRENCES

This amendment does not change the concurrences for southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle (*Haliaeetus leucocephalus*), and Gila trout (*Oncorhynchus gilae*).

#### BIOLOGICAL OPINION AMENDMENT

This amendment does not change the project description, species description and status, the environmental baseline, effects, cumulative effects, sections of this opinion.

#### INCIDENTAL TAKE STATEMENT

This amendment does not change the incidental take statement, the amount or extent of take, the effect of take, or the reasonable and prudent measures. This amendment does modify implementing term and condition 1.5 only, as follows. All other implementing terms and conditions remain as in the original biological opinion.

The following replaces term and condition 1.5:

*The permit system for day use in West Fork will be implemented no later than March 2000; implementation of the permit system for overnight use in West Fork will begin no later than March 2000.*

#### CONSERVATION RECOMMENDATIONS

No change to the conservation recommendations is made by this amendment.

#### REINITIATION - CLOSING STATEMENT

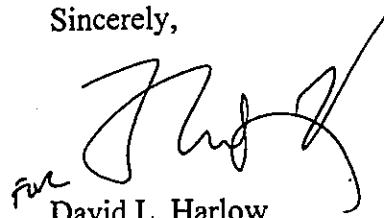
The provisions of the reinitiation statement of the May 5, 1998, biological opinion apply to this amendment.

Mr. Ken Anderson

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If we can be of further assistance, please contact Michele James (520/527-3042) or Bruce Palmer (x237).

Sincerely,

A handwritten signature in black ink, appearing to read "David L. Harlow". The signature is stylized with a large, sweeping "D" and a long, horizontal stroke extending to the right.

David L. Harlow  
Field Supervisor

cc: Field Supervisor, U.S. Fish and Wildlife Service, Albuquerque, NM  
Forest Supervisor, Coconino National Forest, Flagstaff, AZ (Attn: Cecilia Overby)

Director, Arizona Game and Fish Department, Phoenix, AZ

Sedona Forest Plan-Amendment to BO:MAJ:jh



United States Department of the Interior  
Fish and Wildlife Service

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In Reply Refer To:

AESO/SE

2-21-98-F-209

May 5, 1998

Mr. Ken Anderson  
District Ranger  
Beaver Creek/Sedona Ranger Districts  
P.O. Box 300  
Sedona, Arizona 86339

Dear Mr. Anderson:

The U.S. Fish and Wildlife Service has reviewed the Biological Assessments and Evaluations of the proposed Sedona Ecosystem Management Forest Plan Amendment located on the Coconino National Forest. Your March 1, 1998, request for formal consultation was received on March 3, 1998. This document represents the Service's biological opinion on the effects of Amendment 12 on the Mexican spotted owl (*Strix occidentalis lucida*) (MSO) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

According to the March 2, 1998, Amended Biological Assessment and Evaluation (BAE) for the MSO, the Forest Service has determined that the proposed Sedona Ecosystem Management Forest Plan Amendment 12 "may adversely affect" the MSO. In addition, the Forest Service has determined that the Forest Plan Amendment "may effect, but is not likely to adversely affect" the following species: southwestern willow flycatcher (*Empidonax traillii extimus*); bald eagle (*Haliaeetus leucocephalus*), and; Gila trout (*Oncorhynchus gilae*). The Forest Service has determined that the Forest Plan Amendment will not effect critical habitat for the southwestern willow flycatcher. Since critical habitat for the MSO was revoked (63 FR 14378), no conferencing or consultation is required for critical habitat for this species. In addition, the Forest Service has determined that the proposed Forest Plan Amendment will have "no effect" on the American peregrine falcon (*Falco peregrinus anatum*) and the Yuma clapper rail (*Rallus longirostris yumanensis*). This biological opinion provides concurrence for the Forest Service's effect determinations for the southwestern willow flycatcher, the bald eagle, and Gila trout.

This biological opinion is based on information provided in the BAE for the MSO (March 2, 1998), the Amended MSO BAE (January 2, 1998), and an Addendum to the Amended MSO BAE (March 30, 1998); the BAE for the bald eagle (December 13, 1997); the BAE for the southwestern willow flycatcher (December 10, 1997); the BAE for the Gila trout (October 31, 1997); the Environmental Assessment for an Amendment to the Forest Plan for the Sedona Area (July 1997); Sedona/Oak Creek Ecosystem Characteristics and Condition: Executive Summary and Supplemental



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Information (January 1996); the Decision Notice and Finding of No Significant Impact (FONSI) for an Amendment to the Coconino National Forest Plan for the Sedona Area (Amendment 12) (drafts provided on November 15, 1997, and December 10, 1997); updated Goals, Objectives, Standards and Guidelines (facsimile received April 9, 1998); meetings with Janie Agyagos, Jennifer Burns, and Jerry Bradley, Beaver Creek/Sedona Ranger Districts, on July 30, 1997, September 5, 1997, and April 27, 1998), meetings and telephone conversations in April 1998 with Jennifer Burns, Sedona Ranger District, and; numerous telephone conversations with Janie Agyagos, Sedona Ranger District between July 1997, and April 1998. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, the effects of recreation and disturbance, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file in this office.

It is the Service's biological opinion that implementation of Amendment 12 of the proposed Sedona Ecosystem Management Forest Plan is not likely to jeopardize the continued existence of the Mexican spotted owl.

### CONCURRENCES

#### Southwestern Willow Flycatcher and Designated Critical Habitat

The Forest Service determined that the preferred alternative "may effect, but is not likely to adversely affect" the southwestern willow flycatcher, and will have "no effect" on designated critical habitat.

There are currently no known occupied flycatcher sites in the planning area. There is no potential habitat identified in the planning area. Potential habitat does occur in numerous areas in the Verde Valley, with two sites occurring several miles south of the planning area boundary.

Critical habitat for the flycatcher was designated along West Clear Creek, Wet Beaver Creek, and the Verde River (in the Verde Valley) effective August 21, 1997. No critical habitat occurs in the planning area. The nearest critical habitat occurs at Wet Beaver Creek, located approximately 3 miles from the southeast boundary of the planning area, and along the Verde River, approximately 5 miles from the western boundary of the planning area.

In 1994, wildlife biologist Janie Agyagos conducted intensive reconnaissance surveys to determine where suitable and potential flycatcher habitat occurred in the Verde Valley. It was determined that Oak Creek Canyon was unsuitable due to high stream gradients ( $> 2\%$ ) and narrow flood plains which, because of frequent scouring floods, prevented the establishment of dense under and mid-story willow stands. Likewise, it was determined that flycatcher habitat along lower Oak Creek (within the planning area) was very unlikely to develop suitable habitat conditions due to gradient, elevation, and narrow flood plains. However, one area along Oak Creek (Red Rock Crossing)

within the planning area was determined to be suitable due to the presence of an old river channel with active beaver and ponds. This patch of habitat has been surveyed to protocol in 1994, 1995, 1996, and 1997; no responses were elicited. As a result of consultation with the Service on the Windmill Allotment (Biological Opinion, October 28, 1997), the Coconino National Forest has committed to continue surveying this site in the future.

In May of 1993, Rob Marshall of Rocky Mountain Experiment Station, surveyed Dry Beaver Creek and had a response by a single flycatcher. Follow-up surveys of this area resulted in no more responses. It was concluded that the one bird either vacated the site after failing to attract a mate or that the bird was a migrating individual. This site has been surveyed to protocol by Forest Service biologists in 1994, 1995, 1996, and 1997. No responses were elicited. The Forest Service has consulted with the Service on this site during the Apache Maid and Windmill livestock grazing allotments and Beaverhead - Grief Hill Sheep Driveway consultations. Results of those consultations include: survey to protocol every year; initiate a brown-headed cowbird trapping program the following year that the site becomes occupied, and contact the Service should cowbirds be seen associating with sheep during the annual crossing.

The Forest Service describes the suitable flycatcher habitat at Dry Beaver Creek as dominated by sycamore, willow, ash, and cottonwoods. It has an understory made up of a variety of riparian plant species including cattails (*Typha*), sedges (*Carex*), rushes (*Juncus*), horsetail (*Equisetum*), clover (*Meliloris*), deer grass (*Muhlenburgia*), and other grass and forb species. Vegetation is dense from the ground up to 10 or 15 feet. Overstory canopy is sparse due to a low percentage of tree in the older age classes. Water flow is perennial where the suitable flycatcher habitat occurs. The main stream channel has been dammed by beavers resulting in numerous braided channels throughout the floodplain. Flowing water in the braided channels is interspersed with beaver dams that create ponds in a variety of sizes and depths. Silt loads produced during flooding stabilizes the vegetation which is allowing for increased regeneration and recruitment of riparian vegetation. The elevation of this site is approximately 3,600 feet.

The suitable flycatcher habitat at Red Rock Crossing is described as dominated by dense willows that occupy the under and mid-vegetative levels. Cottonwood and ash provide a high percentage of canopy cover in the most suitable areas. Because the flycatcher habitat has developed in an old channel away from the main channel, this patch of habitat is less susceptible to scouring during regular flooding events. Beaver activity has resulted in several dams which create slow flows and standing water. Unlike the main channel of Oak Creek, silt is deposited over the cobble and boulders which supports a dense growth of willows. The elevation at this site is approximately 4,000 feet.

In the planning area, threats to the flycatcher and its habitat include livestock grazing, recreational activities, invasion of exotic plants, and water diversion. Brown-headed cowbird parasitism related to livestock grazing, recreation sites, and agricultural development both on private and public lands, poses a considerable threat to nesting willow flycatchers.

Five livestock grazing allotments occur in the EM planning area: Windmill, Sedona, Boynton Canyon, Apache Maid, and Beaverhead - Grief Hill Sheep Driveway. Permitted livestock grazing in the planning area will be covered under separate consultation processes. Although livestock grazing was not analyzed in the Forest Plan Amendment 12 process, grazing constitutes a portion of the cumulative effects and as a result will be covered in this analysis.

Livestock, grazing in occupied areas, may pose a direct threat to southwestern willow flycatchers by physically disturbing the nest, damaging the nest, or spilling the contents of the nest as they walk by (USDI 1993). This is especially true in single story or regenerating stands. Livestock grazing in riparian areas indirectly affects the southwestern willow flycatcher through habitat degradation and modification of riparian areas. Livestock first deplete the herbaceous component and then begin feeding on riparian shrubs and young trees which results in the reduction of plant diversity and density. Year-round or summer grazing appear to be particularly damaging to riparian habitats (Bock *et al.* 1992). During these periods, regeneration of critical tree species such as willow, ash, cottonwood, and sycamore, may be curtailed (USDI 1993). Other impacts of grazing in riparian habitats include compaction of surface soil which reduces infiltration and increases surface runoff, reduction of bank stability which leads to accelerated erosion and increased sedimentation, and removal of organic material due to reduction in plant vigor and density. These impacts result in a riparian area's increased susceptibility to destruction during heavy flow events. Grazing during the sprouting and regeneration of the cottonwood/willow community after these flood events has led to declines in vigor, increased fragmentation and, in some cases, total degradation. Changes in riparian areas as a result of grazing are often linked to more widespread changes in watershed hydrology.

Livestock grazing from the Apache Maid allotment occurs in the Winter Use Zone which occurs in and around Dry Beaver Creek from January to April each year. In an amendment to the Preferred Alternative for the Apache Maid Allotment dated January 9, 1995, certain measures were agreed upon by the Service and the Forest Service that would allow for continued use of the Winter Use Zone by livestock. These measures included building an exclosure around flycatcher habitat to exclude livestock grazing and the implementation of a cowbird trapping program should the site become occupied by willow flycatchers.

The Beaverhead-Grief Hill Sheep Driveway occurs on the Prescott and the Coconino National Forests, with sheep crossing the Verde River and Dry Beaver Creek. The number of sheep driven from winter to summer ranges has decreased from approximately 20,000 to 24,000 sheep in the 1960- 70's to 4,000 to 5,000 head currently. Current use within riparian areas is limited to the time the sheep cross which is essentially one or two day's partial use. Sheep stop for water and rest but bedding is not permitted within 1/4 mile of water. There are as many as three bands and each band spends approximately 24 hours in the area around May 15 of each year. Potentially, some adverse effects to the southwestern willow flycatcher habitat may occur from the sheep using the riparian area. However, the use is minimal. District biologists were present during the



crossings in 1996 and 1997 in order to observe cowbird activity in response to the sheep. Cowbirds were observed in the area; however, it was determined that the cowbirds were not associating with the sheep due to other attractants in the area.

Livestock grazing from the Sedona Allotment occurs in the Sedona pasture from January to the end of April. There are no riparian fences in this allotment and as a result, cattle are able to graze along Oak Creek where private land owners have not fenced off their property. Livestock grazing in the Sedona and Boynton Canyon Allotments does not occur in Oak Creek (pers. comm. Janie Agyagos, April 1, 1998). Flycatcher surveys from 1994 through 1997 did not indicate any use of the habitat by livestock. The Sedona permit will expire and not be transferred upon the death of the permittee.

The Forest Service, during revision of Allotment Management Plans, has made comprehensive plans to protect the southwestern willow flycatcher from brown-headed cowbird parasitism. When possible, grazing schedules have been manipulated in order to move livestock out of the cowbird's traveling distance from April 1 to July 31 from occupied and suitable flycatcher habitat. When it was not feasible to move livestock, the Forest Service has committed to trap brown-headed cowbirds upon occupancy of the site. As a result of consultation for the Windmill and Apache Maid allotments, brown-headed cowbird trapping programs will be initiated at both Dry Beaver Creek and Red Rock Crossing should these sites become occupied by the southwestern willow flycatcher.

Recreational activities occurring in southwestern willow flycatcher habitat within the planning area include camping, picnicking, fishing, bird watching, swimming, dispersed camping, hunting, and horseback riding as well as construction of recreation facilities, parking areas, and trails. These activities could directly affect the southwestern willow flycatcher by coming into contact with the nest or by causing disturbance to the bird. Indirect effects to the bird may occur when noise from recreation disturb nesting behaviors, when recreationist leave behind refuse which can attract predators and cowbirds, and when recreational activities have negative effects on the vegetation through soil compaction, vegetation clearing, and trail creation (USDI 1995).

Direct effects from recreational activities such as fishing, camping, picnicking, and horseback riding in suitable habitat are low since recreationists are unlikely to conduct these activities in such dense vegetation. However, in areas with potential habitat, especially where the vegetation has not reached full density, impacts from recreational activities are likely to occur.

Recreational activities at Dry Beaver Creek in suitable habitat include camping, swimming and hunting. Located north of the suitable habitat is the Stagesop dispersed recreation site. The approximate number of campers that utilize Stagesop during the active season is estimated to be around 7 camps at any one time between the months of May and October. This dispersed-use campground is also used occasionally by large groups for special events. The Forest Service indicates that surveys for flycatchers at this site from 1994 to 1997 resulted in a few encounters with recreationists in the area with suitable habitat. Since no trails are present and the vegetation

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dense, few recreationist venture into the suitable habitat. The preferred alternative calls for more control of the Stagesop area by creating a parking area and requiring recreationists to hike into the area in order to picnic or camp. The establishment of the parking area will further reduce the number of recreationists that enter the suitable habitat. A separate analysis process will take place for the construction of the parking area which is not located in suitable habitat.

Recreational activities at Red Rock Crossing in suitable habitat include hiking, fishing, picnicking, swimming, bird watching, photography, and self-contemplation (new age activities). Crescent Moon Ranch Picnic Area occurs just downstream from the patch of suitable habitat. This picnic area has 16 individual picnic sites as well as a group area. Parking for 59 vehicles is present. Recreationists from Crescent Moon often walk down to Oak Creek. It is estimated that approximately 125,000 people visit this picnic area between April and October. The only recreational activity observed in and adjacent to the patch of suitable habitat is hiking. Notes from flycatcher surveys at this site indicate that hikers have created a path around and in one spot through the habitat patch. Due to the productivity of this site, the riparian vegetation all but obliterates this trail. Hikers are confined to a very narrow (12" tread) trail that was created by hikers trying to get around this site. Two existing trails near the flycatcher habitat will be improved. Since these trails do not occur in flycatcher habitat yet provide a path from the popular Red Rock Crossing to Cathedral Rock, the improvement of these trails will provide a more desirable travel route consequently keeping recreation use out of the flycatcher habitat. The Red Rock Crossing site is located in the Neighborwoods management area (MA). Direction for this MA prohibits camping and campfires. Due to the dense vegetation, the Forest Service believes that disturbance from recreational hikers is not anticipated to be a problem. However, should the site become occupied by flycatchers, the Forest Service would consider a seasonal closure around the habitat patch. The construction of trails will be analyzed in a separate process.

Water diversions from streams and rivers have reduced surface flows which has resulted in the modification of, and in some areas the loss of riparian vegetation. More specifically, impacts from diversions include changes in riparian corridor width, vegetation types, channel morphology, water temperature, water chemistry, and flow patterns (UDDI 1993b). The final rule listing the species states that irrigation ditches may provide suitable habitat for the flycatcher particularly when irrigation ditches are unlined, seepage is allowed, and phreatophytes are not controlled, however, ditches in the Verde Valley were surveyed for flycatcher habitat and no such habitat was present.

Dry Beaver Creek originates from the confluence of Jack's Canyon and Wood's Canyon drainages. From the headwaters downstream approximately 8 miles, Dry Beaver Creek occurs on Forest Service land. Water is not diverted from Dry Beaver Creek until approximately 6 miles downstream of the suitable habitat where private land occurs. The Red Rock Crossing site occurs on Oak Creek in which there are 15 known and active diversion ditches totaling the potential removal of 1,138 acre-feet of water from Oak Creek. The Forest Service owns the water rights to 147 acre-feet at Crescent Moon Ranch. This water, although diverted, is returned back to Oak Creek unused. The majority of the water diversions occur near Cornville which is located further downstream and out of the planning area.

The preferred alternative calls for the prohibition of off-road-vehicle use. This will contribute to improved watershed conditions. There is no construction of new roads identified in the preferred alternative. In fact, the preferred alternative calls for the closure of 60 miles of road in the planning area. The addition of 84 miles of trails will have an overall beneficial effect to watershed conditions in that new trails will prevent off-trail travel and direct travel in order to minimize erosion and destruction of vegetation. Two existing roads near the flycatcher habitat at Red Rock Crossing are proposed to be closed. One of these roads will be made into a system trail.

The preferred alternative does not identify any parcels of land for acquisition or disposal that would involve flycatcher habitat.

The Forest Plan Amendment includes various goals, objectives, standards, and guidelines developed to protect riparian habitat, including southwestern willow flycatcher habitat. Following is a list of these goals and objectives and standards and guidelines.

*Goals:*

- Riparian communities have adequate in-stream flows and adequate plant cover to protect streambanks and dissipate energy during high flows. Channel characteristics and water quality support natural biodiversity.
- The impacts of non-native plant and animal species are controlled and the introduction on new non-natives is discouraged.
- Threatened, endangered, and sensitive species are recovering.
- Recreational activities and facilities protect water quality and the aquatic/riparian community.
- Forest visitor information achieves orientation, safety, educational, and resource protection goals, and threatened and endangered species recovery.

*Objectives:*

- Fire management activities protect resource values such as property, riparian habitat, and scenic elements.
- Set livestock capacities to levels which maintain and/or improve soil stability, productivity, and water quality.
- Maintain adequate instream flow for aquatic communities.
- Improve and protect water quality and long-term soil productivity and restore critical soil functions through such methods as: improving the rate of water infiltration, thereby reducing on-site soil loss and minimizing surface runoff and sedimentation; enhancing soil organic matter content to improve physical condition and increase nutrient cycling; reducing flood potential and securing favorable conditions to water flow; increasing and improving the distribution of vegetative ground cover and coarse woody debris; setting livestock capacities to levels that

maintain and/or improve soil stability, soil productivity, and water quality; and locating new trails away from riparian communities, steep grades and sensitive soils.

- Acquire private lands when the parcels provide important biological sites.
- Eliminate, redesign, or relocate unneeded or poorly located roads and trails to lessen impacts to resources such as cultural sites, soil and water, wildlife, and to minimize user conflicts.
- Information about the location of sensitive, cultural and biological sites is not provided to visitors.
- Restore damaged sites at Woods Canyon Trailhead using erosion control and revegetation.
- Provide residents with information about introduced noxious plants and the problems they can create for the native ecosystem.
- There are adequate instream flows to maintain aquatic communities.

*Standards:*

- Monitor and protect water quality of Oak Creek to assure public safety and meet State water quality standards.
- Land exchanges that dispose of National Forest in the planning area will only occur if they result in acquisition of National Forest lands in the planning area.
- Camping and campfires are prohibited in Neighborwoods, Oak Creek Canyon, Redrock Frontcountry, Gateway, Red Cliff, Dry Creek Basin, RNA, and Transitions MAs except in designated places.

*Guidelines:*

- Close trails where impacts to cultural and biological resources are determined to be unacceptable.

The Forest Plan Amendment also includes numerous objectives, standards, and guidelines developed to specifically protect the southwestern willow flycatcher and its habitat. Following is a list of these objectives, standards, and guidelines.

*Objectives:*

- Seek out, use, and share information from researchers and other individuals with knowledge about the southwestern willow flycatcher, brown-headed cowbird parasitism, predation, and other related issues. Keep current on new information and make changes in management of southwestern willow flycatcher habitat and population accordingly.
- Activities in suitable habitat maintain or enhance southwestern willow flycatcher habitat.
- Activities in potential habitat do not slow or prevent potential habitat from progressing towards suitable habitat conditions.

*Standards:*

- Conduct site visits to identify suitable and potential southwestern willow flycatcher habitat, inventory suitable habitat to located nesting southwestern willow flycatchers, and monitor sites currently and previously occupied by southwestern willow flycatchers.
- Maintain and enhance southwestern willow flycatcher habitat. Minimize disturbance to nesting southwestern willow flycatchers.

*Guidelines:*

- Personnel conducting inventory or monitoring must obtain the permits and attend inventory and monitoring training prior to conducting inventory and monitoring.
- Compile, map in GIS, and file in an electronic database information obtained from southwestern willow flycatcher site visits, inventory, and monitoring efforts.
- Evaluate recreational impacts at sites with occupied, suitable, or potential flycatcher habitat. Actions to minimize or remove adverse impacts may include but are not limited to, area closures (seasonal or year-long), limits on group sizes, road closures, interpretation and education, fencing, special use permits requirements, and trash management.
- Coordinate with fire management personnel to develop a strategy for responding to wildfires that could threaten occupied, suitable, or potential flycatcher habitat.
- Activities in occupied habitat do not reduce the suitability of the habitat nor cause disturbance to nesting flycatchers during the breeding season.
- Coordinate with the USFWS, AGFD, and any other agency or organization involved in on-going research to determine monitoring needs for occupied flycatcher sites. Information needs and site specific considerations are important to determine the intensity, frequency, and implementation strategy for monitoring occupied sites.
- Exclude livestock grazing in occupied southwestern willow flycatcher habitat to avoid direct impacts to flycatchers and their habitat. Allow grazing in occupied southwestern willow flycatcher habitat outside of its critical season only where flycatcher research is occurring under a research plan approved by USFWS and other project cooperators.
- Implement brown-headed cowbird control programs at occupied flycatcher sites based on USFWS consultation requirements and site-specific determination of need.
- Suitable habitat should be inventoried annually to determine the presence of southwestern willow flycatchers. If an inventory does not occur, the guidelines for occupied habitat apply.
- Site visits to potential habitat should be conducted every few years in order to document the habitat's progression towards suitable habitat characteristics.

The Service concurs with the Forest Service determination that the preferred alternative "may effect, but is not likely to adversely affect" the southwestern willow flycatcher.

### BALD EAGLE

Nesting bald eagles in the Verde Valley are located along the Verde River which is outside of the planning area. There are no known or suspected bald eagles nesting within the planning area. Bald eagles observed along Oak Creek during the summer have been unpaired individuals and have been associated with opportunistic feeding areas, such as the Page Spring Fish Hatchery, located on State land.

Numerous bald eagle surveys occur within the planning area. One of the most consistent surveys, the Bald Eagle Winter count, has been occurring annually since 1992. This survey focuses on obtaining a count of wintering eagles statewide and is accomplished by conducting surveys along established routes. Currently, and for the past five years, the Arizona Game and Fish Department in cooperation with the Forest Service, conducts annual winter counts along established routes. One route, the Oak Creek route, bisects the planning area. Survey results are as follows: three adult eagles were observed in 1992, two eagles were sighted during the 1993 surveys, the Oak Creek route was not surveyed in 1994, although surveyed in 1995, no eagles were sighted, and one adult and one immature was sighted in 1996. Wintering bald eagles can be found throughout the planning area foraging on waterfowl and fish along Oak Creek and on carrion and small terrestrial mammals in non-riparian areas.

No winter bald eagle roosts have been identified in the project area. The nearest known roost sites have been located at Lake Mary and Mormon Lake on the Mormon Lake Ranger District and Mullican Canyon on the Beaver Creek Ranger District. Potential habitat for eagle winter roost sites in the planning area is limited to the canyons and rims where ponderosa pine and mixed conifer forests occur.

Wintering bald eagles have been sighted in a variety of vegetation types including riparian (Oak Creek and Dry Beaver Creek), chaparral (Schnebly Hill, Capitol Butte), desert grassland (Dry Beaver area), pinyon-juniper (Compactor Road), and ponderosa pine/mixed conifer (AB Young and Sterling trails). Eagles have also been sighted along Highway 179 in close proximity to Interstate 17.

Suitable, unoccupied nesting habitat occurs along Oak Creek in the planning area. This habitat is marginal when compared to occupied nesting habitat along the Verde River. Available nesting substrate in Oak Creek is mainly trees unlike the Verde River where abundant cliff faces occur and are being used as nesting substrate the majority of the time. Cliffs and pinnacles are important to bald eagles for other activities such as for roosting, perching, and for lookouts while hunting. Bald eagle prey species include waterfowl and fish for both Oak Creek and the Verde River. Due to

factors such as fewer and more shallow pools, less water volume (7 cfs in Oak Creek versus 20 cfs in the Verde), and higher levels of recreational activity, the diversity and density of fish species is lower and waterfowl is less abundant in Oak Creek.

The main threat to wintering bald eagles in the planning area is from direct and indirect impacts from recreational activities. Recreational activities such as camping, picnicking, fishing, and hiking may disturb wintering bald eagles when these activities occur in areas where wintering bald eagles are foraging. These activities may also indirectly affect the bald eagle by damaging the riparian habitat that supports bald eagle prey species such as waterfowl and fish. Although there is little potential to occur, bald eagles may be struck by vehicles while foraging on road-killed animals. This appears to be more of a threat along Interstate 17 (which occurs outside of the planning area) where there is a higher rate of vehicle/animal collisions.

The preferred alternative provides for more recreation and traffic management. The Forest Service indicated that an increase in recreation and traffic management will result in less impacts to foraging bald eagles. Recreation in the Oak Creek Canyon will be mainly day use with more restrictions on developed and dispersed camping. Less camping in Oak Creek will result in increased protection of the riparian area ultimately improving conditions for bald eagle prey species such as waterfowl and fish. The reduction of overnight camping in Oak Creek Canyon, coupled with no dispersed over-night camping in the Neighborwoods, Red Rock Frontcountry, Dry Creek, Red Cliff, and Gateway MAs, will shift camping activities to the Lower Oak Creek, Oak Creek Canyon, and Savannah MAs in the planning area and to other locations outside of the planning area. An increase in camping in the Lower Oak Creek, Oak Creek Canyon, and Savannah MAs may result in an increased level of disturbance to foraging bald eagles.

The preferred alternative identifies the need to protect riparian communities through closure of dispersed camping areas and closure of roads adjacent to streambanks. The closure of roads and dispersed camping near riparian areas will benefit the bald eagle by allowing less disturbance to foraging eagles from human and vehicular activity and improved habitat conditions for eagle prey species. These road closures are not near nesting eagles; the actual closure of the roads will not cause disturbance to the species.

The preferred alternative calls for upgrading approximately 84 miles of unofficial trails to become part of the official trail system. Unofficial social trails will be closed. Trailheads will be constructed. The construction of official, marked trails will relocate recreational use on social trails from sensitive areas such as riparian, steep slopes, and sensitive soils to areas that can withstand high use.

Because wintering bald eagles forage over a large area and utilize all habitat types, the disposal of land through land exchange can potentially result in loss of small areas of foraging habitat. One parcel of National Forest System land identified for disposal, Slide Rock, is more valuable than the others because of its close proximity to Oak Creek and foraging habitat. The Oak Creek properties that have been identified for acquisition will be the most valuable for the same reason, i.e. as foraging habitat associated with Oak Creek.

The Forest Plan Amendment includes various goals, objectives, standards, and guidelines, while not specific to the bald eagle, will indirectly protect bald eagle foraging habitat, prey species, and nesting habitat. Following is a list of these goals, objectives, standards, and guidelines.

*Goals:*

- Natural elements of the landscape are restored and protected. Threatened, endangered, and sensitive species are recovering. Appropriate actions are taken to minimize impacts to threatened and endangered species.
- Riparian communities have adequate in-stream flows and adequate plant cover to protect streambanks and dissipate energy during high flows. Channel characteristics and water quality support natural biodiversity.

*Objectives:*

- Improve and protect water quality and long-term soil productivity and restore critical soil functions by: minimizing surface runoff, erosion, and sedimentation; reducing flood potential where possible; securing favorable conditions of water flow; setting livestock capacities to levels which maintain and/or improve soil stability, productivity, and water quality; locating new trails away from riparian areas, steep grades and sensitive soils; hardening trail and road surfaces; limiting recreation to designated areas; providing toilet facilities at key places; and improving road and trail maintenance.
- Eliminate, redesign, or relocate unneeded or poorly located roads and trails to lessen impacts to resources such as cultural sites, soil and water, or wildlife and to reduce user conflicts. Restore areas heavily damaged by vehicle or foot traffic. Use methods such as barriers, closures, and visitor information.
- Work with the Federal Aviation Administration (FAA) , Sedona Airport Administration, and air tour operators to minimize the effects of aircraft on threatened, endangered, or sensitive animal species.
- Collaborate with the AGFD and the U.S. Fish and Wildlife Service to re-introduce the round-tailed chub into Lower Oak Creek, if, after a review of the potential habitats, methods, and economics, it is a viable project.
- Native fish community exists and functions naturally within the lower reaches of Oak Creek. There is an appropriate range of spawning, rearing, and overwintering habitat to support native fish. Increase angler awareness of and demand for native fish.
- Research is conducted to further define the habitat requirements of the native fish community and to identify actions to protect and/or restore habitat conditions and increase native fish populations.
- Complete the assessment of road densities, conditions, and locations within the Oak Creek watershed in order to identify actions needed to reduce impacts on the floodplain, peak flows, and sediment routing.



- Ensure adequate in-stream flow to maintain aquatic communities and water sources for wildlife.
- There is an appropriate range of spawning, rearing, and overwintering habitat to support the native fish community within Oak Creek.
- Woody materials such as logs, tree limbs, and snags, are present in riparian communities for prey base habitat, aquatic nutrient cycling, and soil retention, consistent with public safety.
- Acquire undeveloped private property needed to protect critical riparian habitats.

*Standards:*

- Restrict commercial filming related activities to protect threatened, endangered and sensitive species.
- Restrict motorized vehicles to system roads and trails, except as authorized by permit.
- Monitor and protect water quality of Oak Creek to assure public safety and meet State water quality standards and the State unique water status of Oak Creek.

*Guidelines:*

- Cooperate with the AGFD to stock fish and provide fishing access to meet goals and objectives for Arizona Cold Water Fisheries Strategic Plan.
- Assess existing and proposed floodplain developments for their impacts on floodplain function and channel processes.

The Service concurs with the Forest Service's determination that the preferred alternative "may effect, but is not likely to adversely affect" the bald eagle.

## GILA TROUT

Specimens caught prior to 1890 and in 1913 indicate that the Gila trout once occurred in Oak Creek and West Fork of Oak Creek. Hybridization with the non-native rainbow trout, introduced into Oak Creek at least by 1898, is considered the main reason for the extirpation of Gila trout in Oak Creek.

Upper Oak Creek (from the headwaters at Sterling Canyon down to Grasshopper Point) and West Fork Oak Creek most likely supported populations of Gila trout prior to the introduction of the nonnative rainbow trout. Except for the presence of non-native trout species, Oak Creek and West Fork Oak Creek provide suitable habitat for the Gila trout. The objective of the Gila Trout Recovery Plan is to ensure that the survival is secured and viable populations are maintained in the wild. This calls for reestablishing Gila trout within portions of its former range. In the planning area, one area, West Fork Oak Creek, has been identified as a potential reintroduction site for the Gila trout.

Since the Gila trout is extirpated from Oak Creek and reintroduction efforts would be limited to West Fork Oak Creek, only the effects to Gila trout habitat in West Fork Oak Creek relative to the recovery potential for this fish were analyzed. The West Fork of Oak Creek falls within the Wilderness and Special Area MAs of the Sedona Ecosystem Management area.

Threats to this species include competition for food and shelter with predatory or competitive fish species, hybridization with other salmonids, angler pressures, and habitat loss and degradation from floods, drought, and fires.

Existing impacts to Gila trout habitat include recreational activities, rainbow trout stocking, and flooding events. Recreational activities such as camping, picnicking, swimming, and fishing, occur in and adjacent to West Fork Oak Creek. These activities can degrade Gila trout habitat by affecting shoreline habitat required for redd construction, by degrading streamside vegetation that provides shading and hiding cover, and degrading the water quality which may affect aquatic invertebrates species. Since there are few roads and other hardened sites in the West Fork watershed, water runoff from roads and hardened sites is not expected to contribute to water contamination.

The preferred alternative calls for a change in management for West Fork Oak Creek. Camping in West Fork Oak Creek will be allowed in designated areas by a reservation and permit system only, and campfires will be prohibited. Designated camping spots will be located where there will be little or no conflict with threatened and endangered wildlife and plant species. Existing trails will be consolidated into one trail with a minimal number of creek crossings. Group size will be limited to 12 or fewer people. The proposed permit system and designated campsite system in West Fork is anticipated to greatly reduce the impacts from recreation activities on the riparian habitat.

The potential exists for Gila trout habitat to be affected by wildfire. Since campfires will be prohibited in West Fork Oak Creek and camping activity will be controlled by a permit system, the threat of fire from recreationists is low. However, natural fires from lightning and man-caused fires could affect the water quality of West Fork Oak Creek. Changes in pH, increased salinity, increase turbidity, reduced canopy cover and increased temperatures, all result in poor condition for Gila trout and the aquatic invertebrates on which they feed.

The future development of fire management plans for Oak Creek Canyon and Red Rock - Secret Mountain Wilderness will ultimately reduce the risk of wildfire in the West Fork Oak Creek and Oak Creek Canyon by identifying areas for fuelbreaks construction and fuel load reduction. The effects of prescribed burning and fuelwood treatments on the Gila trout will be analyzed in a separate, site-specific BAE once the fire plan has been finalized.

The Forest Plan Amendment will include various goals and objectives and standards and guidelines developed to protect the riparian areas in which Gila trout may be reintroduced. The following is a list of these goals and objectives and standards and guidelines.

*Goals:*

- Riparian communities have adequate in-stream flows and adequate plant cover to protect streambanks and dissipate energy during high flows. Channel characteristics and water quality support natural biodiversity.
- Threatened, endangered, and sensitive species are recovering.
- Forest visitor information achieves orientation, safety, educational, and resource protection goals, and threatened and endangered species recovery.
- Recreational activities and facilities protect water quality and aquatic/riparian community.

*Objectives:*

- Eliminate, redesign, or relocate unneeded or poorly located roads and trails to lessen impacts to resources such as cultural sites, soil and water, or wildlife and to reduce user conflicts.
- Fire management activities protect resource values, such as properties, riparian habitat, and scenic elements.
- Consolidate the numerous trails up West Fork of Oak Creek to one primary trail located to avoid impacts to sensitive plants.
- Fire management strategies are prepared and implemented for all Wildernesses.
- Native fish habitat exists and functions within the West Fork of Oak Creek.
- Angling opportunities are available.
- Assess the need for additional limitations on visitor use at Boynton Canyon and West Fork of Oak Creek
- Rehabilitate severely impacted Wilderness sites, including West fork, Bell Rock, Sycamore Pass, Sedona's northern and east interface, Marg's Draw, and Boynton Canyon.
- Protect soil productivity and water quality where needed by: locating new trails away from riparian areas, steep grades and sensitive soils; provide adequate drainage; hardening trail and road surfaces; limiting recreation to designated areas; providing toilet facilities at key places; and improving road and trail maintenance.
- Information about the location of sensitive, cultural and biological sites is not provided to visitors.

*Standards:*

- Prohibit camping and campfires in the West Fork of Oak Creek, except in designated campsites.
- Noncommercial group size limited to no more than 25 persons without permit in Casner RNA and to 12 persons or fewer in West Fork of Oak Creek.
- Campfires are prohibited in West Fork of Oak Creek.

*Guidelines:*

- Keep creek crossing to a minimum when designing the trail route in the West Fork of Oak Creek.
- Locate camp areas in West Fork of Oak Creek consistent with threatened, endangered, and sensitive species protection.
- Collaborate as needed with Federal or State agencies for the reintroduction and maintenance of native plant and wildlife species.

The Service concurs with the Forest Service's determination that the preferred alternative "may effect, but is not likely to adversely effect" the Gila trout.

### CONSULTATION HISTORY

Informal consultation on the Sedona Forest Plan Amendment began on July 30, 1997, when Michele James of the Service's Flagstaff Suboffice met with Janie Agyagos, Jennifer Burns and Jerry Bradley of the Beaver Creek/Sedona Ranger Districts, to discuss the proposed action. Michele James met with Janie Agyagos again on September 5, 1997, to discuss the effects of both specific projects and the overall Plan Amendment to the peregrine falcon. Discussions with the Forest Service up to this point indicated that determinations of effect for all species would be "no effect" or "may effect, not likely to adversely affect," thus it was expected that consultation could be completed informally. Based on review of the January 22, 1998, BAE for the MSO, the Service requested additional information from the Forest Service regarding the level of recreational use on the West Fork Trail. The Forest Service provided this information in an electronic mail message on February 19, 1998. Michele James of the Service informed Janie Agyagos verbally on February 25, 1998, that the Service would not be able to concur with the Forest Service's "may effect, not likely to adversely affect" determination for the MSO. The Service's specific concerns and reasons for non-concurrence were discussed and the Service recommended that the Forest Service request formal consultation for this species.

The Forest Service requested formal consultation in a letter dated March 1, 1998, and received by the Service on March 3, 1998. The Forest Service's March 1, 1998, letter included an Amended BAE for the MSO (dated March 2, 1998), which included additional information and made a "may effect, likely to adversely affect" determination for the species. The Forest Service's March 1, 1998, letter respectfully requested a biological opinion no later than March 31, 1998. On March 18, 1998, Janie Agyagos verbally informed Michele James that a footbridge was planned for construction on the West Fork Trail, and that this action was not discussed in the Amended MSO BAE. Further discussion indicated that the construction of this footbridge would change the effects to the MSO as discussed in the Amended MSO BAE. The Forest Service provided a description of the proposed footbridge construction project in an Addendum to the Amended MSO BAE, dated March 30, 1998. Additional phone conversations and electronic mail messages in April 1998, provided the Service with answers to specific questions. The Service met with Janie Agyagos, Jennifer Burns, and Katherine Farr of the Coconino National Forest on April 27, 1998, to discuss specific reasonable and prudent measures.

## DESCRIPTION OF THE PROPOSED ACTION

The Sedona/Oak Creek planning area includes nearly 200,000 acres of National Forest System lands in the vicinity of Sedona, Arizona, Coconino National Forest. The area stretches from Sycamore Canyon on the west, to Interstate 17 on the east, above the Mogollon Rim to the north, and to Beaverhead Flats and the savannah to the south. The area encompasses the Red Rock Secret Mountain Wilderness, Munds Mountain Wilderness, House Mountain, Oak Creek Canyon, and the city of Sedona. It includes land in both Yavapai County and Coconino County. In the past, Forest Service lands surrounding the city of Sedona have been managed with broad, general guidelines. The Forest Service indicates that the Coconino Forest Plan written in 1987 did not anticipate either the many social issues of a rapidly urbanizing community or the exponential increase in tourism. The proposed Sedona Ecosystem Management Forest Plan Amendment includes both policy changes and project decisions for the planning area. This plan amendment is expected to be in place for approximately 15 years. Policy changes, such as new direction for land trades, have not received detailed, site-specific analysis to date. Further analysis will occur before a specific land trade, for instance, is implemented.

According to the July 1997 Environmental Assessment, the proposed Sedona Forest Plan Amendment allows human activities, where appropriate, to provide access to the redrock landscape, provides interpretation and facility development, stresses the conservation of special wildlife habitats such as Oak Creek Canyon and the red cliffs, protects and interprets cultural resources, and considers American Indian traditions. Key aspects of the Sedona Forest Plan Amendment include:

- *New Management Areas* - Divides the planning area into 12 Management Areas (MAs), with themes identified. The MAs are: Neighborwoods; Redrock Frontcountry; Wilderness; Gateway; Oak Creek Canyon; Lower Oak Creek; Special Areas; Schnebly Rim; Dry Creek Basin; Red Cliff; Savannah; Transition.
- *Measures for Wildlife Habitat Enhancement* - Identifies the need to protect riparian areas through closure of dispersed camp areas, closure of roads adjacent to streambanks, and improvements at Stage Stop on Dry Beaver Creek. Develops specific objectives to improve sensitive habitats especially for species listed as threatened, endangered, or sensitive.
- *Trail System and Trailhead Expansion* - Allows for site-specific trail closures and trail designation which will reshape part of the District trail system. The intent of this decision is to close unofficial social trails (user-created trails), while designating and upgrading approximately 84 miles of unofficial trails to become part of the official trail system. Trailhead lists will be updated and improvements made. Boynton Canyon and Woods Canyon Trailheads will be relocated.

- *Limits on Group Size* - Non-commercial groups will be limited to 24 or fewer without a permit (outside Wilderness), except in Savannah and Gateway MAs (where it remains 74 or less). In Wilderness, the group size limit will generally be 12 or fewer persons.
- *Day Use Emphasis* - Day use activities including picnicking and interpretation at sites along Oak Creek corridor and other places will be emphasized. Banjo Bill and Bootlegger Campgrounds in the Canyon will be converted to day use recreation sites.
- *New Recreation Opportunity Spectrum Distinctions* - Refines recreation management for the area, using the Recreation Opportunity Spectrum (ROS) mapping.
- *Land Trades* - National Forest System lands within the planning area will only be disposed of to acquire properties of significant cultural and natural resource value within the planning area. This policy also limits the National Forest System lands available for disposal to specific parcels that have been identified as Base-for-Exchange. This base is located away from the redrocks, in "The Dells" near the Sedona Wastewater Plant. Before any actual land exchange takes place, further environmental analysis must occur to disclose the site-specific impacts of such an exchange. Approximately 780 acres of the highest priority parcels that would be acquired through land exchanges involving the Dells were identified. These parcels include Lincoln Canyon, Hancock Ranch, Woo Ranch, Bradshaw Ranch, Tree Farm, Cockscomb, and the Tucker property. Other private properties of interest such as the Long Canyon property and Oak Creek properties could still be acquired using means other than land exchange involving the Dells. Specific parcels for disposal include Slide Rock, Brewer Road Ranger Station, Village of Oak Creek Golf Course, Chapel of the Holy Cross, Tree Farm, and the Dells.
- *Camping* - Limits dispersed camping in much of the planning area, while slightly increasing developed camping. Dispersed camping and campfires will be prohibited except in Savannah, Wilderness, Transition, Lower Oak Creek, and Schnebly Rim MAs. Designates a campground in Dry Creek Basin. Parking and walk-in camping will be provided at Stage Stop. Converts 18 campsites at Banjo Bill and Bootlegger to day use, resulting in a total of 158 developed campsites in Oak Creek Canyon.
- *Roads* - Site-specific road closures will be updated, and guidelines to allow other road and travel closures where needed to protect resources will be provided. Off-road driving in the planning area will be prohibited. Approximately 60 miles of road are recommended to be closed in the planning area. Strong direction to reduce traffic and vehicle impacts at National Forests sites is provided. The need for orientation and education of off-highway vehicles (OHV) tourists is identified and a route and marker system for appropriate OHV use is identified.

- *Prehistoric and Historic Archaeology* - Access to Palatki, Honanki, Van Deren Cabin, and Boynton Canyon will be limited. Camping and campfires in Boynton Canyon will be prohibited, and visitors will be required to stay on established trails. American Indian heritage sites will be managed in response to tribal concerns and traditional uses. This will include charging fees at some sites and on-site stewards.
- *Commercial Uses* - Limits new commercial tour operations and adjusts existing tours. New commercial tours will be limited to mountain biking or public transportation or where new use of touring can significantly increase protection of cultural and biological resource sites. Current commercial tour operations will be adjusted to meet MA goals, Recreational Opportunity Spectrum (ROS) objectives, and partnership opportunities. Commercial and personal use firewood and Christmas tree cutting, as well as controlled firewood gathering and other mechanical methods of removing wood will be limited to designated locations in the Savannah MA. Commercial filming related aircraft use will be limited to Savannah MA and to limited areas in the adjacent Gateway MA.
- *Wilderness Management* - Group sizes in Wilderness will be limited to 12 or fewer persons. Guidelines to protect natural quiet as an important resource will be provided. A permit system will be established for day and overnight use in the Red Rock - Secret Mountain Wilderness. Camping throughout West Fork Canyon will occur at designated sites by permit only. Campfires will be prohibited in West Fork. Camping, campfires, and off-trail travel will be prohibited throughout Boynton Canyon.
- *Natural Quiet* - Establishes guidelines for the protection of natural quiet as an important resource. Shooting in high use areas such as Neighborwoods, Redrock Frontcountry, and along Schnebly Hill Road will be limited. Group size limits will also assist in managing the area for natural quiet. Provides specific direction to pursue specific flight rules with the Federal Aviation Administration (FAA) and work with the Sedona Airport Administration, commercial air tour companies, and other aviation interests to pursue voluntary compliance with these flight advisories.
- *Casner Powerline Off-Highway Vehicle Route* - Allows 4X4 use on this route under certain conditions.

## STATUS OF THE SPECIES

### Species Description - Mexican spotted owl

A detailed account of the taxonomy, biology, and reproductive characteristics of the MSO is found in the Final Rule listing the MSO as a threatened species (USDI 1993a) and in the Final MSO Recovery Plan (USDI 1995). The information provided in those documents is included herein by reference. Although the MSO's entire range covers a broad area of the southwestern United States and Mexico, much remains unknown about the species' distribution and ecology.

This is especially true in Mexico where much of the MSO's range has not been surveyed. The MSO currently occupies a broad geographic area but does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to forested isolated mountain systems, canyons, and in some cases, steep, rocky canyon lands. The primary administrator of lands supporting MSO in the United States is the U.S. Forest Service. Most owls have been found within Forest Service Region 3 (including 11 National Forest in Arizona and New Mexico). Forest Service Regions 2 and 4 (including 2 National Forests in Colorado and 3 in Utah) support fewer owls. According to the Recovery Plan, 91% of MSO known to exist in the United States between 1990 and 1993 occurred on lands administered by the Forest Service.

Surveys have revealed that the species has an affinity for older, well-structured forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico. The range of the MSO has been divided into six Recovery Units (RUs), as discussed in the MSO Recovery Plan (USDI 1995). The Recovery Plan reports an estimate of owl sites. An owl "site" is defined as a visual sighting of at least one adult owl or a minimum of two auditory detections in the same vicinity in the same year. This information was reported for 1990-1993. The greatest known concentration of known owl sites in the United States occurs in the Upper Gila Mountains RU (55.9%), followed by the Basin and Range-East RU (16.0%), Basin and Range-West RU (13.6%), Colorado Plateau RU (8.2%), Southern Rocky Mountain-New Mexico RU (4.5%), and Southern Rocky Mountain-Colorado RU (1.8%). Owl surveys conducted from 1990 through 1993 indicate that the species persists in most locations reported prior to 1989.

A reliable estimate of the absolute numbers of MSO throughout its entire range is not available (USDI 1995) and the quality and quantity of information regarding numbers of MSO vary by source. USDI (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico.

At the end of the 1995 field season, the Forest Service reported a total of 866 management territories (MTs) established in locations where at least a single MSO had been identified (U.S. Forest Service, *in litt.* November 9, 1995). The information provided at that time also included a summary of territories and acres of suitable habitat in each RU. Subsequently, a summary of all territory and monitoring data for the 1995 field season on Forest Service lands was provided to the Service on January 22, 1996. There were minor discrepancies in the number of MTs reported in the November and January data. For the purposes of this analysis we are using the more recent information. Table 1 displays the number of MTs and percentage of the total number of each Forest (U.S. Forest Service, *in litt.*, January 22, 1996).

The Forest Service has converted some MTs into PACs following the recommendations of the Draft MSO Recovery Plan released in March 1995. The completion of these conversions has typically been driven by project-level consultations with the Service and varies by National Forest.



The Sedona/Oak Creek planning area is located within the Upper Gila Mountains RU as defined by the MSO Recovery Plan (USDI 1995). This RU is a relatively narrow band bounded on the north by the Colorado Plateau RU and to the south by the Basin and Range West RU. The southern boundary of this RU includes the drainages below the Mogollon Rim in central and eastern Arizona. The eastern boundary extends to the Black, Mimbres, San Mateo, and Magdalena Mountain ranges of New Mexico. The northern and western boundaries extend to the San Francisco Peaks and Bill Williams Mountain north and east of Flagstaff, Arizona. This is a topographically complex area consisting of steep foothills and high plateaus dissected by deep forested drainages. This RU can be considered a "transition zone," because it is an interface between two major biotic regions: the Colorado Plateau and Basin and Range Provinces (Wilson 1969). Habitat within this RU is administered by the Kaibab, Coconino, Apache-Sitgreaves, Tonto, Cibola, and Gila National Forests. The north half of the Fort Apache and northeast corner of the San Carlos Indian Reservations are located in the center of this RU and contain an important habitat link between owl subpopulations at the western and eastern ends of the RU and the subpopulations directly south within the Basin and Range West RU.

Table 1. Number of management territories (MTs) as reported by the Forest Service (U.S. Forest Service, *in litt.*, January 22, 1996), percent of MTs as a proportion of the MTs in Forest Service Region 3, and the percent of suitable habitat surveyed in each Forest by National Forest (Fletcher and Hollis 1994).

National Forest	Number of MTs	Percent of MTs	Percent Suitable Habitat Surveyed
Apache-Sitgreaves	122	14.0	99
Carson	3	0.3	62
Cibola	43	5.0	41
Coconino	155	17.8	87
Coronado	108	12.4	49
Gila	197	22.7	50
Kaibab	6	0.7	96
Lincoln	126	14.5	90
Prescott	10	1.2	42
Santa Fe	33	3.8	44
Tonto	66	7.6	55
TOTAL	869	100	

This RU consists of deep forested drainages on the Mogollon Plateau. Vegetation generally consists of pinyon/juniper woodland, ponderosa pine/mixed conifer forest, some spruce/fir forest, and deciduous riparian forest in mid and lower elevation canyon habitat. Climate is characterized by cold winters and over half the precipitation falls during the growing season. Much of the mature stand component on the gentle slopes surrounding the canyons has been partially or completely harvested. Most of the forest habitat on steeper ground that may serve as MSO nesting habitat is in suitable condition. MSO are widely distributed and use a variety of habitats within this RU. Owls most commonly nest and roost in mixed-conifer forests dominated by Douglas fir and/or white fir and canyons with varying degrees of forest cover (Ganey and Balda 1989; USDI 1995). Owls also nest and roost in ponderosa pine-Gambel oak forest, where they are typically found in stands containing well-developed understories of Gambel oak (USDI 1995).

This RU contains the largest known concentration of MSO with approximately 55% of known MSO territories (USDI 1995). This RU is located near the center of the MSO's range within the United States and is contiguous to four of the other five RUs within the United States. Because of its central location and its large and relatively continuous spotted owl population, the MSO Recovery Team believes that the population in this RU could be uniquely important to the overall stability and persistence of the MSO population in the United States. Specifically, this population could serve as the source population, providing immigrants to smaller, more isolated populations in other RUs. Although the Recovery Team has no data on dispersal patterns or movements between RUs, the Recovery Team believes that this population should be maintained at current levels and with at least the current level of connectivity within the RU (USDI 1995). Significant discontinuities that develop in the MSO's distribution within this RU, and the loss of habitat to support the local sub-populations, may compromise the recovery of the species.

## ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat to provide a platform to assess the effects of the action now under consultation.

### Vegetation Communities and Nature of the Planning Area

The Sedona/Oak Creek planning area contains wide ecological variability, including high cliffs and flat plains, rocky slopes and valleys, moist canyons and dry grasslands. The MSO

nesting/roosting habitat in the planning area is characterized by forests located steep slopes, and canyons. Much of this habitat is located in designated wilderness areas. Oak Creek riparian area consists of alder, maple, ash, aspen and sycamore, with pine and fir forest along the upper reaches of the West Fork and in Secret Canyon and Oak Creek. Ponderosa pine/Gambel oak habitat is present on Schnebly Rim within the planning area.

In 1995, more than 1.3 million people visited developed Forest sites on the Sedona District, a 48 percent increase since 1974, and an estimated 6 million people in more than 2.4 million cars traveled through Oak Creek Canyon. More than 30 percent of the planning area is within designated wilderness areas (Red Rock-Secret Mountain, Munds Mountain, and Sycamore Canyon Wilderness Areas). These wilderness areas are the most visited in Arizona, with nearly a quarter of a million people using the areas each year. In 1995, 84 percent of the use (over 188,000 people) was concentrated in the Red Rock-Secret Mountain Wilderness. More than half of the visitor use of these wilderness areas is concentrated in only three locations: West Fork of Oak Creek, Boynton Canyon, and Bell Rock (Sedona/Oak Creek Ecosystem Characteristics and Condition: Executive Summary and Supplemental Information, Sedona Ranger District 1996).

#### Status of the Mexican Spotted Owl and its Habitat in the Project Area

Protected habitat is present in the planning area within three designated wilderness areas; Red Rock-Secret Mountain, Munds Mountain, and Sycamore Canyon. In addition, seventeen Mexican spotted owl (MSO) Protected Activity Centers (PACs) occur within the planning area. These PACs occur in the Wilderness, Research Natural Area, and Oak Creek Canyon MAs of the planning area.

Table 2. Protected activity centers (PAC) acreages and Management Area location within or partially within the planning area.

PAC Name and Number	Acreage (acres)	Management Area
West Buzzard Point (040203)	756	Wilderness
South Pocket (040204)	722	Wilderness
Harding Point (040213)	640	Wilderness/RNA
Sterling Canyon (040215)	600	Oak Creek Canyon
East Buzzard (040216)	684	Wilderness

Casner Cabin (040217)	611	Wilderness
Barney Springs (040218)	648	Wilderness/RNA
Loy Tank (040219)	633	Wilderness
Rattlesnake Mountain (040220)	595	Wilderness
Hidden Cabin (040221)	630	Wilderness
Secret Cabin (040222)	600	Wilderness
Bunker Hill (040225)	615	Wilderness
Cave Springs (040601)	699	Wilderness/RNA
Buckhead Point (040602)	659	Wilderness/RNA
Bear Sign (040603)	617	Wilderness
Secret Mountain (040604)	832	Wilderness
Secret Canyon (040605)	652	Wilderness
Pumphouse (040512)	602	Oak Creek Canyon

The Forest Service indicates that all of the accessible suitable habitat on the Sedona District was inventoried for the MSO in the early 1990s. Steep canyons on the Mogollon Rim between the Peaks and Sedona Ranger Districts have not been thoroughly surveyed due to inaccessibility. The Forest Service also indicates that most often, surveys in these areas were conducted from the rim tops and the easily accessible canyon bottoms but not in the inaccessible portions of the canyons. Due to inconclusive results, it is not known how many owls are occupying these canyons within the planning area but the habitat suggests there is a high potential for occupancy. The BAE indicates that all MSO surveys in the planning area have been conducted according to U.S. Forest Service protocol through 1996. Monitoring of existing PACs has been limited. In 1996, only 6 of the 17 PACs within the planning area received any form of monitoring: West Buzzard; East Buzzard; Harding Point; Barney Springs; Rattlesnake Mountain; Bear Sign. In 1997, five PACs were monitored: Upper West Fork; West Buzzard; Harding; Buckhead; East Buzzard (pers. comm. Janie Agyagos, Sedona Ranger District, April 1, 1998).

As required by the Recovery Plan, all protected, restricted, and other forest and woodland habitat types have been identified in the planning area. Because of three very large Wilderness areas, a large portion of the planning area is classified as protected MSO habitat. Restricted habitat is comprised of the riparian area associated with Oak Creek and the pine/oak habitat located on Schnebly Rim. The pinyon-juniper woodlands in the planning area has been classified as other forest and woodland types.

The Forest Service has formally consulted on 195 timber sales and other projects in Arizona and New Mexico since August 1993. These projects have resulted in the anticipated incidental take of 81. In addition, the Bureau of Indian Affairs has consulted on one timber sale on the Navajo Reservation which resulted in an anticipated take of five MSO, and a highway reconstruction which resulted in the anticipated incidental take of two MSO. The Federal Highway Administration has consulted on one highway project that resulted in an undetermined amount of incidental take. The take associated with this action will be determined following further consultation. Additionally, the biological opinion for the Kachina Peaks Wilderness Prescribed Natural Fire (PNF) Plan (#2-21-94-F-220) determined thresholds for incidental take and direct take as follows: 1) one spotted owl or one pair of spotted owl adults and/or associated eggs/juveniles; 2) harm and harassment of spotted owls located in up to two PACs per year; 3) disturbance to spotted owls and habitat modification of a total of seven PACs during the life of the Kachina Burn Plan related to management ignited fire occurring in PACs for which the nest site information is three or more years old; 4) harm and harassment of spotted owls and habitat caused by PNF for which adequate surveys have not been conducted, and; 5) harm and harassment of spotted owls and habitat modification of up to one PAC and 500 acres of potential nest/roost habitat caused by wildfire as an indirect result of PNF during the life of the Kachina Burn Plan.

### EFFECTS OF THE ACTION

The MSO Recovery Plan states that timber harvest and catastrophic fire are the primary threats to the owl in the Upper Gila Mountain RU. The Recovery Plan also lists overgrazing by livestock and wildlife and indiscriminate fuelwood cutting as additional threats to the owl. The Recovery Plan and more recently, the Coconino National Forest Plan Amendment 11 provides guidelines for timber harvest, livestock grazing, prescribed burning, and fuelwood harvest within protected, restricted, and other forest and woodland habitat types. The effects of these activities on the MSO will be analyzed individually below.

#### Timber and Fuelwood Harvesting

Personal use firewood and Christmas tree cutting will be restricted to designated locations within Savannah MA. There is no protected or restricted MSO habitat in the Savannah MA. Non-commercial tree removal in the planning area may be required for administrative (health or safety) or vegetative management (pest infestation) reasons. Removal of hazardous trees for public safety in designated campgrounds or along public thoroughfares will be permitted on a case by case basis. Removal of hazardous trees in owl habitat will be minimized and conducted outside of the owl breeding season in order to reduce disturbance. Any vegetation treatment activities in owl habitat will be analyzed for effects and any necessary consultation will occur on a site-specific basis if needed. Indiscriminate fuelwood harvesting, while not a primary threat to the MSO, has been identified as a threat to MSO habitat in the Upper Gila Mountain RU due to

the removal of large oaks, downed logs, and large snags (USDI 1995). Timber harvesting falls under Region 3 Forest Plan Amendment 11 which incorporates the MSO Recovery Plan (USDI 1995).

### Prescribed Burning

Catastrophic fire was listed in the Recovery Plan as a primary threat to MSOs in the Upper Gila Mountain RU (1995). The Forest Service indicates that fuel loading in owl habitat within the planning area is currently at levels that pose a threat of catastrophic wildfires. The Coconino National Forest Plan Amendment 11 lists specific parameters in which prescribed burns and fire risk abatement activities should be conducted. The Amended Forest Plans biological opinion completed on November 25, 1996, determined that these actions (the adoption of the MSO Recovery Plan) would not jeopardize the MSO (consultation #000031RO).

#### In PACs:

- Select for treatment 10% of the PACs where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the PACs where nest sites are known as a paired sample to serve as control areas.
- Designate a 100 acre "no treatment area" around the known nest site of each selected PAC. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center.
- Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected PAC outside the 100 acre "no treatment" area.
- Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leaved woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar.
- Select and treat additional PACs in 10 percent increments if monitoring of the initial sample shows there are no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods.
- Use light prescribed burns in non-selected PACs on a case-by-case basis. Burning should avoid a 100 acre "no treatment" area around the activity center. Large woody debris, snags, clumps of broad-leaved woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar.
- Pre- and post-treatment monitoring should be conducted in all PACs treated for fire risk abatement.

#### On Steep Slopes:

- Treat fuel accumulations to abate fire risk.
- Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire.

- Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leaved woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar.
- Pre- and post-treatment monitoring should occur within all steep slopes treated for fire risk abatement.

The Recovery Plan (USDI 1995) encourages the use of prescribed natural fires in Wilderness, RNAs, and other reserved lands as long as prescriptions maintain key structural features of owl and small prey habitats. Prescribed burning in restricted habitat is encouraged in order to reduce hazardous fuel accumulation as long as thinning from below occurs (if necessary) before burning to reduce ladder fuels and the risk of crown fires.

The Sedona Forest Plan Amendment preferred alternative identifies a need for prescribed burning and fuelwood reduction throughout the planning area in order to improve ecosystem functions and provide safer conditions for the public. The preferred alternative proposes to update the Munds Mountain Wilderness Fire Management Plan and to develop a Prescribed Natural Fire Management Plan for the Red Rock-Secret Mountain. These plans will adhere to the standards and guidelines designed to protect the MSO and their habitats (Amendment 11). Once these plans are developed, they will be analyzed for their effects to threatened and endangered species. Any necessary consultation will occur at that time on a site and project-specific basis.

#### Livestock Grazing

The Recovery Plan (USDI 1995) states that livestock grazing in MSO habitat can affect habitat structure, composition and vigor as well as food availability and diversity for the owl. Livestock grazing, although occurring in the planning area, has been analyzed under a previous consultation process. All of the protected and restricted MSO habitat in the project area falls within the Windmill Livestock Grazing Allotment for which the Service completed a Biological Opinion dated October 28, 1997 (#2-21-95-F-399).

#### Riparian Management

Riparian areas provide movement corridors between subpopulations of owls and historical data supports that the MSO once used riparian areas for nesting (USDI 1995). Recovery of riparian and watershed conditions may facilitate owl movement and may even provide nesting habitat (USDI 1995). The Forest Service indicates that the riparian area associated with West Fork Oak Creek provides suitable nesting habitat for the MSO. The riparian areas associated with West Fork Oak Creek as well as Oak Creek provide travel corridors for dispersing owls. Maintaining riparian broad-leaved forests in a healthy condition especially in canyon bottom situations, restoring lowland riparian areas, and emphasizing a mix of size and age classes of trees are the recommendations in the Recovery Plan for managing riparian communities.

In addition to the guidelines of the Coconino Forest Plan Amendment 11, the Forest Service indicates that the Sedona Forest Plan Amendment preferred alternative will strengthen the Forest's current policy on riparian protection and enhancement. The numerous goals, objectives, standards, and guidelines to be amended with the preferred alternative include:

**Goals:**

- Riparian communities have adequate in-stream flows and adequate plant cover to protect streambanks and dissipate energy during high flows. Channel characteristics and water quality support natural biodiversity.
- Commercial uses are conducted in a way that sustain long-term soil productivity, properly functioning ecosystems, and riparian functions.

**Objectives:**

- Improve and protect water quality and long-term soil productivity and restore critical soil functions by: minimizing surface runoff, erosion, and sedimentation; reducing flood potential where possible; securing favorable conditions of water flow; setting livestock capacities to levels which maintain and/or improve soil stability, productivity, and water quality; locating new trails away from riparian areas, steep grades and sensitive soils; hardening rail and road surfaces; limiting recreation to designated areas; providing toilet facilities at key places; and improving road and trail maintenance.
- Ensure adequate in-stream flow to maintain aquatic communities and water sources for wildlife.
- Woody materials such as logs, tree limbs, and snags, are present in riparian communities for prey base habitat, aquatic nutrient cycling, and soil retention, consistent with public safety.
- Water quality in Oak Creek complies with Arizona State water quality standards and the State unique water status of Oak Creek.
- Assess existing and proposed floodplain developments for their impacts on floodplain function and channel processes.
- Develop a trails strategy for Oak Creek Canyon that allows creek access while protecting the riparian community, wildlife habitat, and sensitive plants. Reduce the high levels of use at West Fork Oak Creek by expanding opportunities for interpretive trails and pleasure walking at Cave Springs and Call of the Canyon.



- Evaluate the need for additional limitations on visitor use at Boynton Canyon and West Fork Oak Creek.
- Consolidate the numerous trails up West Fork to one primary trail located to avoid impacts to sensitive plants. Keep creek crossings to a minimum when designating the trail route. Designate camp areas in West Fork consistent with threatened, endangered, and sensitive species protection.
- Rehabilitate damaged Wilderness sites, including West Fork, Bell Rock, Sycamore Pass, Sedona's northern and east urban interface, Marg's Draw, and Boynton Canyon.
- Eliminate, redesign, or relocate unneeded or poorly located roads and trails to lessen impacts to resources such as cultural sites, soil and water, or wildlife and to reduce user conflicts. Restore areas heavily damaged by vehicle or foot traffic. Use methods such as barriers, closures, and visitor information.
- Complete the assessment of road densities, conditions, and locations within the Oak Creek watershed in order to identify actions needed to reduce impacts on the floodplain, peak flows, and sediment routing.
- Acquire undeveloped private property needed to protect critical riparian habitats.
- Acquire private lands if the parcels resolve recreation issues or have important public values such as important biological sites, riparian, or wetland communities.

*Standards:*

- Monitor and protect water quality of Oak Creek to assure public safety and meet State water quality standards and the State unique water status of Oak Creek.
- Camping and campfires prohibited in Redrock Frontcountry and Neighborwoods.
- Camping in designated areas only in West Fork of Oak Creek; campfires prohibited.

*Guidelines:*

- Assess existing and proposed floodplain developments for their impacts on floodplain function and channel processes.
- Maintain riparian pasture and riparian exclosure fences to ensure that livestock trespass is not occurring and resulting in the degradation of threatened, endangered, and sensitive species habitat.

The riparian area associated with West Fork of Oak Creek is protected MSO habitat and the riparian area associated with Oak Creek is restricted MSO habitat. The numerous goals, objectives, standards, and guidelines pertaining to riparian areas in the preferred alternative and those existing in the current amended forest plan are consistent with the MSO Recovery Plan guidelines for management of riparian areas.

Recreation

The Sedona Forest Plan Amendment preferred alternative will amend the current forest plan with the following objectives, standards, and guidelines developed to address recreation issues and concerns in MSO habitat:

*Objectives:*

- Eliminate, redesign, or relocate unneeded or poorly located roads and trails to lessen impacts to resources such as cultural sites, soil and water, or wildlife and to reduce user conflicts. Restore areas heavily damaged by vehicle or foot traffic. Use methods such as barriers, closures, and visitor information.
- Evaluate the need for additional limitations on visitor use at Boynton Canyon and West Fork of Oak Creek.
- Consolidate the numerous trails up West Fork to one primary trail located to avoid impacts to sensitive plants. Keep creek crossings to a minimum when designating the trail route. Designate camping areas in West Fork consistent with threatened, endangered, and sensitive species protection.
- Rehabilitate damaged Wilderness sites, including West Fork, Bell Rock, Sycamore Pass, Sedona's northern and east urban interface, Marg's Draw, and Boynton Canyon.
- Explore the need and feasibility for reducing campfire smoke in Oak Creek Canyon from April until November to improve habitat conditions for bats, birds and other wildlife species.

- Develop a trails strategy for Oak Creek Canyon that expands opportunities for interpretive trails and pleasure walking sites including Cave Springs Campground, Call of the Canyon (to help reduce the high levels of use at West Fork Oak Creek.
- Develop an interpretive trail on the east side of Oak Creek at Call of the Canyon to reduce pressure on the Oak Creek RNA and to meet the demand for access and interpretation along Oak Creek.

*Standards:*

- Camping and campfires are prohibited in Neighborwoods, Oak Creek Canyon, Redrock Frontcountry, Gateway, Red Cliff, Dry Creek Basin, RNA, and Transition MAs except in designated places. In the future, additional camping and campfire restrictions may be needed.
- To protect resources and maintain high quality recreation settings, non-commercial groups in excess of 25 people need a special use permit, except in the Savannah and Gateway MAs and pullouts on SR 179 in the Redrock Front Country MA, where groups exceeding 75 are required to have a permit.
- Noncommercial group size limited to no more than 25 persons or fewer in Casner RNA and to 12 person or fewer without a permit in West Fork of Oak Creek.
- Prohibit camping in the West Fork of Oak Creek, except in designated campsites. Prohibit campfires.
- In Wilderness, group size limits will generally be 12 or fewer persons.

*Guidelines:*

- Discourage groups of over 12 persons in Wilderness.
- Limit dispersed camping to locations that protect resources, provide neighborhood security, and protect National forest visitor's quality of experience.
- Close trails where impacts to cultural and biological resources are determined to be unacceptable.

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Recreational activities including camping, hiking, off-road vehicles (ORV), and rock-climbing may affect the MSO depending on location, intensity, frequency, and duration (USDI 1995). Direct effects may occur when these activities impact nests, roosts, and foraging sites. The Recovery Plan indicates that indirect effects may occur when recreational activities degrade habitat either through vegetation trampling, removal, or accidental burning and soil compaction.

The Recovery Plan provides several recommendations for recreational activities within PACs: no new construction or expansion of new facilities or structures, should occur within a PAC during the breeding season; the presence and intensity of allowable recreational activities within PACs should be assessed; and seasonal closures of specifically designated recreational activities should be considered where appropriate.

The Coconino National Forest Plan Amendment 11 calls for limiting human activities in PACs during the breeding season, avoiding road or trail building in PACs, and generally allowing continuation of levels of recreational activities in PACs that were occurring prior to listing of the owl. Table 3 displays the recreational activity which is occurring within the 17 PACs in the Planning Area.

**Table 3. Summary of Recreational Activity and Type in MSO PACs within the Planning Area.**

PAC Name & Number	No. of Trails	No. of Roads	No. of Campgrounds	No. of Developed Facilities
West Buzzard Point (#040203)	1	0	0	0
South Pocket (#040204)	0	0	0	0
Harding Point (#040213)	1	0	0	0
Sterling Canyon (#040215)	0	1	0	0
East Buzzard (#040216)	1	0	0	0
Casner Cabin (#040217)	0	0	0	0
Barney Springs (#040218)	1	0	0	0
Loy Tank (#040219)	0	3	0	0
Rattlesnake Mtn. (#040220)	0	2	0	0
Hidden Cabin (#040221)	0	3	0	0

Secret Cabin (#040222)	3	0	0	0
Bunker Hill (#040225)	0	1	0	0
Cave Springs (#040601)	1	0	0	0
Buckhead Point (#040602)	1	0	0	0
Bear Sign (#040603)	0	0	0	0
Secret Mountain (#040604)	1	0	0	0
Secret Canyon (#040605)	0	0	0	0
Pumphouse (#040512)	0	1	0	0

### Cave Springs PAC

The West Fork Trail passes through the middle of the Cave Springs PAC, and is located between the 1.2 mile and 2.9 mile markers of the West Fork Trail (pers. comm. Janie Agyagos, Sedona Ranger District, April 29, 1998). The MSO BAE indicates that the intensity, duration, and frequency of dispersed recreational activity in the first two miles of the West Fork Trail is high. Data from the West Fork registration box and a counter placed in the surface of the trail has demonstrated the amount of use this area receives. The Forest Service has calculated the number of visitors on the trail by multiplying the number of people who signed in at registration boxes by an adjustment factor. Because not all people sign in at registration boxes, a counter was placed in the trail in 1996 which enabled Forest Service recreation resource managers to determine what percentage of people did not register. The percentage became the adjustment factor. The numbers derived from multiplying the number of people who signed in at the registration box by this adjustment factor are estimated to be accurate at +/-20 percent (MSO BAE).

Use by day hikers and backpackers on the West Fork Trail has increased by 89 percent from 1995 to 1997 (see Table 4). Because the registration box and counter were both placed at the beginning of the trail, the numbers derived from this data do not indicate how many people hike past the two-mile mark. Based on personal observations by Forest Service wilderness rangers, use drops 90 percent after the first two miles and after the first three miles, use drops to approximately 10 people per day during the peak recreation season (March through September).

Little is known about the owls in the Cave Springs PAC. The Cave Springs territory was established based on a pair response on June 11, 1990. A follow-up daytime survey on June 15, 1990, did not locate the pair or a nest site. A single owl response was recorded on July 3, 1990, but a daytime follow-up survey on July 19, 1990, did not locate any MSO. Information provided in the MSO BAE indicates that a single MSO of unknown sex was located in this

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territory on August 8, 1991, (pers. comm. Janie Agyagos, April 1, 1998). It is unclear if a daytime follow-up visit was conducted in 1991. Review of the survey data forms of 1990 and 1991, indicate that the recorded locations of MSO were in the same quarter quarter section, in a side canyon of West Fork. The legal description indicates that this side canyon is located with 0.25 miles of the West Fork Trail. Survey notes (1990 and 1991) indicate that this side canyon is rather narrow, with steep cliffs, and is comprised of mixed conifer and riparian habitat.

Table 4. Recreation Use Numbers for West Fork Trail by Use Type: 1995-1997.

Year	No. of Hikers	No. of Backpackers	Total No.
1995 actual	14,698	313	15,011
1995 adjusted	52,619	1,121	53,739
1996 actual	22,125	328	22,543
1996 adjusted	79,208	1,174	80,382
1997 actual	27,949	378	28,327
1997 adjusted	100,057	1,353	101,411

Camping in the West Fork Oak Creek currently is allowed after the six mile mark of the Trail. However, the Forest Service indicated that due to the sinuous nature of the creek, hikers often mistake the mileage and camping sometimes begins around the two mile mark, which is within the Cave Springs PAC. In response to this, Amendment 12 will change management of the West Fork Oak Creek area by requiring permits and reservations for camping, and allowing camping only in designated areas, and prohibiting campfires. The Forest Service's goal is to locate all designated camping areas outside of owl PACs, but because of topography, it may not be feasible to do so. Since the location of nest/roost sites for the Cave Springs owls are unknown, the Forest Service indicates that this PAC will be monitored in 1998 in order to gain sufficient information before making decisions on future management actions such as camping area locations and the location of the officially designated West Fork Trail. Based on current PAC boundaries, there is one-half mile of trail between the Cave Springs PAC and the next PAC upstream (the Buckhead PAC), which should provide sufficient space for a designated camping area outside of the PACs (pers. comm. Janie Agyagos, Sedona Ranger District, April 29, 1998). The Service strongly approves of the decision to locate camping areas outside of PACs and believes this will assist in minimizing adverse effects to the owl.

The Forest Plan Amendment initiates the development of a trails strategy for Oak Creek Canyon that expands opportunities for interpretive trails and pleasure walking sites including the Cave Springs Campground, Call of the Canyon and the development of an interpretive trail on the east side of Oak Creek at Call of the Canyon. The Forest Service indicates that this may assist

in reducing the recreational pressure in West Fork of Oak Creek. Amendment 12 also initiates a permit system for day and overnight hikers in the Wilderness, where this PAC is located. Although there will be no immediate restrictions on the numbers of day hikers allowed in West Fork, the Forest Service indicates that the permit system will provide a more adequate method for tracking the amount of use the West Fork Trail receives. Based on data obtained from the permit system, the Forest Service may begin restricting the number of permits issued for this trail at some point in the future.

The Service agrees that the implementation of a permit system for day hikers in West Fork will assist the Forest Service in accurately determining current and future recreation use, but the Forest Service provides no indication of upper limits of use that will be permitted on this trail. Given that Forest Service data indicated the actual use of the West Fork Trail increased 89 percent from 1995 to 1997, the Service is concerned that use will continue to increase in the future, thereby potentially increasing adverse effects to MSO in this PAC. The Forest Service believes that the implementation of a permit system for both day and overnight use in West Fork will assist in determining current and future recreation use, and can provide the basis for future decisions to restrict access in West Fork; the Plan Amendment is estimated to be implemented for the next 15 years (pers. comm. Jennifer Burns, Sedona Ranger District, April 20, and April 27, 1998). Currently, the only limits on day use in West Fork are the availability of parking at Call of the Canyon Parking Area. The Forest Service indicates that this parking area can hold 49 cars and 2 buses at any one time. This parking area is full to capacity during the summer months (pers. comm. Jennifer Burns, Sedona Ranger District, April 27, 1998).

The response of wildlife to recreational disturbance is complex, and the effects are not immediately obvious or easily determined (Hammitt and Cole 1987; Flather and Cordell 1995). An understanding of the potential conflicts between recreationists and wildlife has begun to occur in land management as we near the end of the twentieth century (Knight and Gutzwiller 1995). This has been based in large part on the significant increase in wildland recreational activity in the United States. In the 10-year period between 1982 and 1992, day hiking alone in the United States has increased almost two-fold, from 26 million to 50 million (Flather and Cordell 1995). Evidence suggests that recreational activity can harm wildlife (Knight and Cole 1995). Tolerance levels for wildlife interactions with humans will vary by time of year, breeding season, age, habitat type, and individual experience with recreationists (Hammitt and Cole 1987). Human activities can impact wildlife directly through exploitation and disturbance, or indirectly through habitat modification and pollution. The Service's concerns with regards to the Cave Springs PAC include the current and future recreation use and the potential direct effects to the MSO of disturbance and harassment, and to a lesser extent, the indirect effects of prey habitat modification.

The MSO Recovery Plan indicates that the determining factor of a recreational activity's impact on spotted owls is a combination of its location, intensity, frequency, and duration. These four factors as they relate to the Cave Springs PAC are discussed below.

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The locations of MSO vocalizations within this PAC in 1990 and 1991 indicate that the owls were located in a side canyon just off of the West Fork drainage, within approximately the first 2 miles of the West Fork Trail. Locations are within 0.25 miles of the West Fork Trail. The locations of human-wildlife interactions may influence the effects to wildlife. In particular, the presence of humans in key wildlife areas may present major impacts (Hammitt and Cole 1987). The West Fork Trail is located in the bottom of a steep canyon and runs immediately adjacent to West Fork of Oak Creek, crossing it in multiple places. MSO survey data forms indicate that the character of the side canyon where the owls were heard is fairly narrow and steep. The physical characteristics of the side canyon may assist in providing topographic screening. Topographic screening between the area of disturbance and the birds location creates a noise buffer, and may assist in the reduction of noise disturbance (Knight and Cole 1995). But, the physical structure of canyons can also tend to magnify disturbances and limit escape/avoidance routes for owls (USDI 1995).

According to the Recovery Plan, PACs are to be at least 600 acres in size and should be drawn so as to encompass the best possible owl habitat, configured in as compact a unit as possible, with the nest or activity center located near the center. The Recovery Plan indicates that a 600 acres PAC will encompass 75 percent of the home range of an average owl. The Cave Springs PAC is 699 acres in size, and has been drawn so that the 1990 and 1991 owl vocalization site is located very near the center. The West Fork Trail passes through the southern portion of the PAC and then traverses along the western edge of the PAC. The Trail is within the PAC for a distance of over one mile. Wildlife response to noise varies widely. The Service has consistently recommended a buffer of at least 0.25 miles between disturbing activities and MSO nest/roosts during the breeding season. Nesting has never been documented in this PAC for the years survey/monitoring occurred. However, monitoring did not occur between the years of 1992 and 1997, thus a thorough and complete record of MSO activity in this PAC does not exist. It is possible that owls have nested in the side canyon where first heard in 1990 and 1991, which is located within 0.25 miles of the West Fork Trail. Noise created by recreationists using the West Fork Trail can be heard in the side canyon, potentially effecting the owls. It is possible that MSO are nesting elsewhere in the PAC, or even that they have moved out of the PAC due to recreational disturbance. Because MSO have not been monitored in this PAC for the past 6 years, it is difficult to make any definite conclusions about the current presence or location of MSO in this PAC. Because the best available information indicates that MSO have utilized the side canyon for at least 2 years, and because MSO are known to exhibit site tenacity (Gutierrez *et al.* 1995), it can be assumed that this canyon presented favorable conditions for either nesting, roosting, and/or foraging.

Table 4 illustrates that use of the first 2 miles of the West Fork Trail totaled 101,411 persons in 1997, based upon adjusted numbers. If this use was spread out over an entire year, average use was 278 persons per day. The Forest Service indicates that use is concentrated during a peak period of seven months (March through September), which could mean that up to 483 persons per day use at least the first 2 miles of the West Fork Trail during this peak period. The MSO Recovery Plan (USDI 1995) states that groups of 12 or more hikers or a steady



stream of hikers occurring in narrow canyon bottoms may be especially disturbing to owls. The peak recreational period overlaps the entire MSO breeding season which extends from March 1 through August 31. It can be assumed that use of the Trail at rates of between approximately 300 and 500 people per day would result in a steady stream of hikers along the Trail. In addition, such high use may result in large groups of hikers along the trail, whether intentionally hiking in groups, or because groups are formed unintentionally due to hikers backed up behind each other. The combination of very high use levels, a steady stream of hikers, and large groups of hikers, means the first 2 miles of the Trail is likely to be in constant use from dawn through dusk during the breeding season, and perhaps even into the early evening as hikers return to the trail head parking. Personal observation indicates that many hikers on this trail are noisy, especially when hiking in groups. The Service believes the potential for disturbance to MSO in the PAC exists given the trail location relative to past MSO locations, as well as the high recreational use levels on the Trail during the MSO breeding season.

The Addendum to the Amended MSO BAE indicates that the Forest Service proposes to construct a pedestrian footbridge across Oak Creek on the West Fork Trail near the trailhead. Currently, hikers access the West Fork Trail by wading or rock-hopping across Oak Creek at a crossing located on private land. The Forest Service indicates that construction activity will occur during the MSO breeding season and will entail the construction of a trail from the parking lot to the footbridge, from the footbridge to the existing West Fork Trail, and construction of a bridge abutment and installation of the footbridge. Ground disturbance will occur on 0.07 acres, and the following equipment will be used: front-end loaders, a large crane, a truck and concrete pump, and chainsaws. Access to Oak Creek will be gained via an existing Arizona Public Service power line right-of-way, and no vegetation removal will occur. However, vegetation removal in the riparian zone will occur for construction of the east abutment. This will consist of removal of 11 Gambel oak trees ranging in size from 6 to 16 inches diameter at breast height, as well as the removal of alders, blackberry, and small Gambel oak in the riparian zone (pers. comm. Jerome Chapin, Sedona Ranger District, April 22, 1998).

The Cave Springs PAC is located within 0.25 miles of the proposed footbridge location. Currently, when flows in Oak Creek are high, hikers are unable to cross Oak Creek without wading, and this limits further use of the Trail. Flows are generally high in the spring when snow runoff occurs, and again during the summer months when there is increased precipitation due to monsoons. The construction of the footbridge will increase the number of hikers using the West Fork Trail during the spring and summer months which coincides with the MSO breeding season. The footbridge will result in increased recreational use within the PAC during the breeding season compared to that which currently occurs. Given that a nest site for this PAC has not been located and the footbridge and trail construction will entail the use of heavy equipment during the breeding season within 0.25 miles of the PAC, the Service believes the potential exists for direct disturbance to MSO from construction of the footbridge. Indirect effects to restricted habitat will also occur, as riparian vegetation and large Gambel oak will be

removed for abutment construction. In addition, indirect effects are likely, as the footbridge will facilitate an undetermined increase of recreational use within the PAC during the breeding season.

There are three learned responses wildlife may show to recreationists: habituation, attraction, and avoidance (Knight and Temple 1995). Recreational disturbance during the breeding season may affect an individual's productivity; disturbance outside the breeding season may affect the individual's energy balance and, therefore, its survival. Birds may respond to disturbance during the breeding season by abandoning their nests or young, by altering their behavior such that they are less attentive to the young, which increases the risk of the young being preyed upon, or by disrupting feeding patterns, or by exposing young to adverse environmental stress (Knight and Cole 1995).

Owls have more sensitive hearing than other birds (Bowles 1995). If a noisy sound source arouses an animal, it has the potential to affect its metabolic rate by making it more active. Increased activity can, in turn, deplete energetic reserves (Bowles 1995). Noisy human activity can cause raptors to expand their home ranges, but often the birds return to normal use patterns when the humans are not present (Bowles 1995). Such expansions in home ranges could affect the fitness of the birds, and thus their ability to successfully reproduce and raise young. Species that are sensitive to the presence of people may be displaced permanently; this may be more detrimental to wildlife than recreation-induced habitat changes (Hammit and Cole 1987; Gutzwiller 1995; Knight and Cole 1995). Due to the lack of complete MSO surveys of the adjacent habitat in the project area, it is not known if unoccupied nest/roost habitat is available to replace disturbed habitat in the Cave Springs PAC. If replacement habitat is of poorer quality, reproduction levels may be effected (Hammit and Cole 1987). If animals are denied access to areas that are essential for reproduction and survival, then that population will decline. Likewise, if animals are disturbed while performing essential behaviors such as foraging or breeding, that population will also likely decline (Knight and Cole 1995). There is also evidence that disturbance during years of a diminished prey base of voles for instance, can result in lost foraging time which, in turn, may cause some raptors to leave an area or not to breed at all (Knight and Cole 1995).

There are no completed studies to date on the effects of recreational activities specific to the MSO. Research on all subspecies of the spotted owl indicate that it exhibits docile behavior when approached by researchers, and there is no clear evidence of significant impact by research activity except for a negative effect on reproduction from back-pack radio transmitters (Gutierrez *et al.* 1995). However, researchers purposefully make as little noise as possible, and disturbance is very limited in duration. In the long term, some species may become less responsive to human disturbance if they are not deliberately harassed; others may become very stress-prone towards humans (Bowles 1995; Hammit and Cole 1987). Excessive interaction with humans may cause a lowering of call response rates or habituation; the effects of habituation on spotted owls is unknown (Gutierrez *et al.* 1995). Owls have been known to begin calling during the breeding season in response to the sound of human voices (personal

observation). Such behavior is likely characteristic of a certain percentage of individuals, and this attraction to humans may create a situation where these owls are discovered by hikers, thereby exposing themselves to potential direct impacts.

In addition to the West Fork Trail, the Cave Springs Campground occurs within 0.25 miles of the Cave Springs PAC. A ridge separates the Campground from the PAC and likely assists in blocking campground noise from the PAC.

The West Fork Trail is located adjacent to the West Fork of Oak Creek drainage, and the trail crosses the creek in multiple places. Riparian vegetation associated with West Fork provides potential nesting habitat for the MSO (MSO Amended BAE). Riparian areas also provide excellent foraging habitat for the owl. Ecologists suspect that spotted owls select habitats partially because of the availability of prey (USDI 1995). Ward and Block (1995) found that the reproductive success of MSO was not influenced by a single prey species, but rather by many species in combination. Trails in riparian areas affect the soil and riparian vegetation adjacent to the trail, as well as the aquatic system itself. By directly impacting these components, recreationists affect an animal's food supply and availability as well as its habitat; in turn, impacts on food and habitat influence behavior, survival, reproduction, and/or distribution (Cole and Landres 1995). Impacts on soil include compaction of mineral soil, reductions in total porosity, reductions in infiltration rates, and increases in soil erosion (Cole and Landres 1995). These changes in soil characteristics can adversely affect the germination, establishment, growth and reproduction of plants. Direct impacts to vegetation also comes from crushing and uprooting of vegetation. Consequently, recreation areas characteristically have vegetation that is less abundant (reduced density and cover), of a reduced stature, and with different species composition from undisturbed areas (Cole and Landres 1995). Removal of living vegetation effects the habitat and food sources of small mammals; at the same time, human food sources attract rodents and certain species of small mammals and birds (Hammit and Cole 1987). Therefore, while the effects of vegetation alteration in the riparian area may affect MSO prey negatively, the food brought in by humans may increase prey densities. The Forest Service indicates that campfires will not be permitted in West Fork, therefore, removal of dead and down material for campfires will not occur. The Service strongly approves of this decision. Campfire prohibition will also assist in reducing the risk of human-caused wildfire in West Fork, one of the primary threats to the MSO.

In summary, effects of high levels of recreational use to the Cave Springs MSO are very difficult to quantify, given the lack of a nest site in this PAC, and the lack of species-specific studies. Given the historic locations of MSO in the PAC, as well as the habitat characteristics of West Fork, it appears likely that MSO may have nested or attempted to nest in close proximity to the trail. Given this, there is the possibility that MSO may again attempt to nest in this PAC proximate to the West Fork Trail. Because the historically used side canyon is within close proximity to the West Fork Trail, as well as other potential nest habitat, the Service believes disturbance to MSO in this PAC is likely. This disturbance may affect the ability of MSO to nest and successfully reproduce and fledge young. In addition, direct and indirect

effects to riparian habitat are and will continue to occur due to the Trail location, and camping. Effects to this habitat may negatively effect MSO prey species. Conversely, recreationists may cause an increase in some small mammal populations due to increasing food sources for these species. Footbridge construction during the breeding season has the potential to adversely affect MSO in the PAC, and the footbridge itself will permit increased use of the West Fork Trail during the MSO breeding season.

#### Other PACs

Buckhead (040602), Harding Point (040213), Barney Springs (040218), East Buzzard (040216), and West Buzzard (040203) PACs also occur in West Fork Oak Creek. The West Fork Trail occurs along the Barney Springs and Buckhead Point PAC boundaries and passes through the Harding Point, East Buzzard and West Buzzard PACs. As the Cave Springs PAC effects discussion above indicates, most of the use on the West Fork Trails occurs within the first two miles of the Trail. The Buckhead PAC occurs 3.5 miles upstream of the trailhead, and the remaining PACs occur even further upstream. The Forest Service indicates that the intensity, frequency, and duration of recreational activities in these five PACs is much lower than that which occurs in the Cave Springs PAC. The Forest Service indicates that recent surveys suggest that the Harding Point and Buckhead owls are nesting and roosting in side drainages out of West Fork, but review of monitoring data provided in the BAE indicates that nest sites have not been located for either of these PACs. In addition, nest sites have not been located for the remaining three PACs.

The Amendment will limit party size to 12 or fewer persons. This applies to both day and overnight use. Anyone wanting to camp in West Fork will be required to obtain a permit and reservation, and camping will be restricted to designated areas only. Campfires will be prohibited. The dispersed campsites will be located out of MSO PACs where feasible.

After review of PAC boundaries and MSO roost locations in these five PACs in which the West Fork Trail passes, the Service believes the potential for recreational impacts exists, although at a much lower level than that predicted for the Cave Springs PAC. Recreational use on the West Fork Trail is currently at levels that exceed 100,000 people per year in the first 2 miles. Currently, camping is not permitted until the six-mile mark along the trail. The Service understands that backpacking into this point is difficult and therefore limits the use further upstream on the Trail. To address this, the preferred alternative will designate camping areas at locations within the first 5 miles of the Trail, perhaps as close as 2.5 miles from the confluence of Oak Creek and West Fork. The Service believes this could potentially increase the number of recreationists that use the trail beyond the 2-mile mark, to a level above the current use level of approximately 10 persons per day reported by the Forest Service (MSO BAE). It is also possible that designated camping areas may be located in MSO PACs.

It is unclear what level of recreational use within a PAC may adversely affect the MSO, and much of the potential effect is based on very site specific information on nest/roost locations and behavior of individual birds. The Service is unable to make site-specific analysis on the

effects of use of the West Fork Trail for the MSO using these five PACs because nest sites have not been located to date due to lack of access to this rugged country. The potential for increased use of the West Fork Trail within these PACs, combined with the lack of site-specific nest/roost data may lead to negative impacts to the MSO during the next 15 years of implementation of the Amendment.

Secret Cabin (040222) and Secret Mountain (040604) PACs have trails occurring in the PACs. Secret Cabin has portions of three trails, whereas Secret Mountain has only one trail crossing through the PAC. Use on these trails is low as the PACs are fairly remote. Group sizes of 12 or more will be discouraged in Wilderness areas.

Sterling Canyon (040215), Rattlesnake Mountain (040220), Hidden Cabin (040221), Bunker (040225), Loy Tank (040219) and Pumphouse (040512) PACs all have one or more existing roads running through portions of the PACs. Although the portions of these PACs that occur within the planning area occur in Wilderness where no motorized activities are permitted, there are portions of each PAC that occur in either the Peaks or Mormon Lake District outside of Wilderness and are accessible by low-use roads. There are three roads that occur in the Loy Tank PAC, two roads in the Rattlesnake and Hidden Cabin PACs, and only one road in the remaining PACs. In each of these PACs, the roads occur only on the ridgetops and do not traverse onto steep slopes or into canyon bottoms.

The Casner Cabin (040217), South Pocket (040204), Bear Sign (040602), and Secret Canyon (040605) PACs do not have any roads, trails, campgrounds or developed facilities in or adjacent to the them. Due to the remoteness of these PACs, the intensity, frequency and duration of recreation activities in these PACs is currently low. The preferred alternative will discourage group sizes of 12 or more wilderness areas, which will assist in minimizing potential adverse effects to the MSO.

The Forest Service indicates that any site specific activities which include but are not limited to, prescribed burning, implementation of road and trail plans, vegetation management activities, and removal of hazardous trees, will be analyzed for their effects on the MSO and its habitat. Any needed consultation will occur at that time.

#### Protected Habitat

Protected habitat in the planning area consists of three Wilderness Areas: Red Rock - Secret Mountain, Munds Mountain, and Sycamore. Part of the ecosystem planning process the last three years has been to analyze the impacts of recreational activities on the various resources including TE&S species. In response to increasing levels of recreational activities in Wilderness areas, the preferred alternative calls for limitations on visitor use at Boynton Canyon and West Fork Oak Creek, a Wilderness permit system for the Redrock - Secret Mountain Wilderness area, a prohibition on camping and campfires in Boynton and restriction on camping and campfires to designated areas only in West Fork, prohibition of campfires,

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limits on groups over 12 persons in Wilderness, and limiting commercial activities to trails and campsites designed for that use. This increase in restrictions on recreational activities in Wilderness areas will have an overall result of lower use in protected owl habitat, reduction in habitat alteration, and less disturbance to nesting, roosting, and foraging owls.

### Restricted Habitat

Restricted habitat occurs along Oak Creek in the Oak Creek Canyon, Neighborwoods, Redrock Frontcountry, and Lower Oak Creek MAs. In the portions of Oak Creek that fall within the Neighborwoods and Redrock Frontcountry MAs, there will be a prohibition of camping and campfires. In the Oak Creek Canyon MA, camping and campfires are permitted in designated areas only. The numerous goals, objectives, standards, and guidelines pertaining to riparian areas in the preferred alternative and those existing in the current amended forest plan are consistent with Recovery Plan guidelines for management of riparian areas.

Other restricted habitat in the planning area occurs on the rim in the Schnebly Rim MA. Because stand data for this area exists for only three out of nine locations (compartments), there is limited known restricted habitat. The remainder of the habitat may be restricted but further stand surveys need to be conducted. Since the preferred alternative calls for no habitat altering activities, restricted, threshold, and target habitat was not identified at this time. Amendment 12 calls for developing an integrated roads and trail plan and a prescribed fire plan for the Schnebly Rim area. These plans will be developed in accordance to the recreation and prescribed fire guidelines in the owl Recovery Plan and Coconino National Forest Plan Amendment 11. The appropriate stand exams, delineation of restricted, target, and threshold habitat, and required consultation will occur once these plans have been developed.

## CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions are subject to the consultation requirements established under section 7, and, therefore, are not considered cumulative in the proposed action. In past Biological Opinions, it has been stated that, "Because of the predominant occurrences of MSO on Federal lands, and because of the role of the respective Federal agencies in administering the habitat of the MSO, actions to be implemented in the future by non-Federal entities on non-Federal lands are considered of minor impact." However, there has been a recent increase of harvest activities on non-Federal lands within the range of the MSO. In addition, future actions within or adjacent to the project area that are reasonably certain to occur include urban development, road building and widening, land clearing, trail construction, grazing, and other associated actions. These activities have the potential to reduce the quality of MSO nesting, roosting, and foraging habitat, and cause disturbance to breeding MSO, and would contribute as cumulative effects to the proposed action.

## CONCLUSION

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Sedona Forest Plan Amendment 12, as proposed, is not likely to jeopardize the continued existence of the MSO.

## INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding and sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing responsibility to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

For the purposes of consideration of incidental take of MSO from the proposed action under consultation, incidental take can be broadly defined as either the direct mortality of individual birds, or the alteration of habitat that affects the behavior (i.e. breeding or foraging) of birds to such a degree that the birds are considered lost as viable members of the population and thus "taken." They may fail to breed, fail to successfully rear young, raise less fit young, or desert the area because of disturbance or because habitat no longer meets the owl's needs.

In past Biological Opinions, the management territory was used to quantify incidental take thresholds for MSO (see Biological Opinions provided by the Service to the Forest Service from August 23, 1993 through 1995). The current section 7 consultation policy provides for

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incidental take if an activity compromises the integrity of a PAC. Actions outside PACs will generally not be considered incidental take, except in cases when area that may support owls have not been adequately surveyed.

Using available information as presented within this document, the Service has identified conditions of probable take for the MSO associated with PACs and inadequately surveyed habitat. Based on available information concerning the MSO, habitat needs of this species, the project description, and information furnished by the Forest Service, take is considered likely for the MSO as a result of the following:

- 1) Construction of the footbridge across Oak Creek on the West Fork Trail during the breeding season, and subsequent use of the footbridge during the MSO breeding season.
- 2) High levels of recreational use on the first 2 miles of the West Fork Trail within the Cave Springs PAC.
- 3) Increased recreational use levels within the Buckhead, Harding Point, Barney Springs, East Buzzard, and West Buzzard PACs, and possible location of designated campsites within these PACs.

#### Amount or extent of take

The Service anticipates that two spotted owls and/or associated eggs/juveniles could be taken every other year associated with the Cave Springs PAC as a result of the high recreational use of the West Fork Trail during the breeding season both currently as well as the increase in use because of the proposed footbridge construction. In addition, the Service anticipates that one (1) spotted owl and/or associated eggs/juveniles could be taken every other year associated with one of the following PACs in which the West Fork Trail passes: Buckhead, Harding Point, Barney Springs, East Buzzard, and West Buzzard. The incidental take would be in the form of harassment. As defined by the regulations at 50 CFR 17.3, harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. The Service believes the proposed action of allowing continued high levels of recreational use on the West Fork Trail would result in harassment by allowing noise disturbance during the breeding season, and vegetative removal along the trail within and adjacent to riparian habitat, thereby potentially negatively affecting owl prey species. The Service anticipates that incidental take of MSO will be difficult to detect because all anticipated incidental take is in the form of harassment as result of activities that significantly disrupt or impair normal behavior patterns. Any incident of harassment is likely to be of limited extent and intensity, and therefore difficult to distinguish from normal behavior and difficult to document.



If, during project activities, the amount of extent of take is exceeded, the Forest Service must reinitiate consultation with the Service immediately to avoid violation of section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible or adverse impact on the species, as required by 50 CFR 402.14(i). An explanation of the causes of the taking will be provided to the Service.

#### Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

#### Reasonable and prudent measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the take of MSO:

1. The Forest Service shall minimize direct and indirect effects of visitor use to the spotted owl and its habitat in West Fork to the maximum extent possible.
2. The Forest Service shall minimize adverse effects to the spotted owl from footbridge construction at Call of the Canyon.
3. The Forest Service shall gather information on recreational use and MSO within the Cave Springs PAC to assist in reducing impacts to the owl.

#### Terms and conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

The following terms and conditions are necessary to implement the reasonable and prudent measures:

- 1.1 Prohibit campfires in West Fork of Oak Creek Canyon.
- 1.2 Designate camping areas in West Fork of Oak Creek Canyon no closer than 2.5 miles from the confluence of Oak Creek and West Fork.

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- 1.3 Designated camping areas in West Fork will be no more than 5 in number, with each camping area accommodating 2-4 camping parties (party size to be generally 4 persons), and will be located outside of spotted owl protected activity centers (PACs) where possible.
- 1.4 Total annual overnight use in West Fork will be maintained at or less than 1997 use levels (approximately 1300 persons), through the implementation of a reservation only permit system.
- 1.5 The permit system for day use in West Fork will be implemented no later than March 1999; implementation of the permit system for overnight use in West Fork will begin no later than March 2000.
- 1.6 The Forest Service will review and reassess Forest Plan Amendment 12 at year 7 of implementation (2004) or at the time of the Coconino National Plan revision, whichever comes first, to determine if still in compliance with the incidental take statement.
- 2.1 A) Footbridge construction on Oak Creek within 0.25 miles of the Cave Springs PAC will be completed from August 25-31, 1998 only, as follows:

Vegetation clearing for access to the east footing site using one chainsaw, one backhoe, and hand loppers, for a period of 4 hours;

Use of one backhoe to excavate east footing site, for a period of 8 hours;

Use of shovels, picks, and wheelbarrows to excavate the west footing, for a period of 16 hours.

-OR-

B) Monitoring of the Cave Springs PAC in 1998 confirms an occupied nest site over 0.25 miles from the footbridge site, or monitoring determines that nesting is not occurring the year of the action. This means the following: 1) a continually used day roost has been found; 2) the male and female MSO are repeatedly located in that location; and, 3) that location is at least 0.25 miles from the proposed construction site or repeated monitoring indicates non-nesting behavior such as the taking of multiple mice without delivery to young or flight to a possible nest; and, the Service reviews the findings of the monitoring and agrees that all of the above conditions are met. If monitoring is unable to locate MSO, or locates only a single MSO, then the Service believes that nesting/non-nesting status cannot be determined "beyond a doubt." The Service believes that review of monitoring can occur rapidly, and concurrence on this point can be given to the Forest Service either verbally or via electronic mail.

- 3.1 The Forest Service shall monitor human day use in West Fork Canyon, including season of use, party size, length of stay, and number of visitors, within at least the first 3 miles of West Fork Canyon. Monitoring shall begin in 1999 so that information on human use and timing facilitated by footbridge construction can be determined.
- 3.2 The Forest Service shall monitor human use as described in term and condition 3.1 for a period of 2 years (1999 and 2000); in 2001, prior to the beginning of the MSO breeding season (March), the Forest Service will meet with the Service to review the results of said monitoring and consider whether additional limitations on day use need to be implemented to reduce effects to MSO. In addition, determination of whether monitoring should continue will be discussed. The Forest Service shall provide this office with results of said monitoring in 1999 and 2000.
- 3.3 The Forest Service shall monitor the Cave Springs PAC in 1998 and 2000, at a minimum, to attempt to determine status and location of MSO. In 2001, prior to the MSO breeding season, the Forest Service shall meet with the Service to review results of said monitoring and consider whether additional monitoring of owls within this PAC should continue, and if so, at what interval. The Forest Service shall provide this office with results of owl monitoring in 1998 and 2000.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than 3 spotted owls and/or their associated eggs/juveniles will be incidentally taken. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Forest Service must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Notice: While the incidental take statement provided in this consultation satisfies the requirement of the Endangered Species Act, as amended, it does not constitute an exemption from the prohibitions of take of listed migratory birds under the more restrictive provisions of the Migratory Bird Treaty Act.

#### DISPOSITION OF DEAD, INJURED, OR SICK SPOTTED OWLS

Upon locating a dead, injured, or sick spotted owl, initial notification must be made to the Service's Law Enforcement Office, Federal Building, Room 8, 26 North McDonald, Mesa, Arizona (telephone: 602/835-8289) within three working days of its finding. Written notification must be made within five calendar days and should include the date, time, and

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location of the animal, a photograph, if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling specimens to preserve the biological material in the best possible state. If possible, the remains of intact owl(s) shall be provided to this office. If the remains of the owl(s) are not intact or are not collected, the information noted above shall be obtained and the carcass left in place. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should the treated owl(s) survive, the Service should be contacted regarding the final disposition of the animal.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Close the hiker-created trail that traverses through the suitable southwestern willow flycatcher habitat at Red Rock Crossing to assist in minimizing potential direct impacts to this habitat. The Service recommends that this be completed as soon as possible.
2. Minimize removal of trees and vegetation, to the maximum extent feasible, during footbridge abutment construction on Oak Creek.
3. Increase the size of the Rattlesnake Mountain MSO PAC (040220) to at least 600 acres.
4. If camping areas within West Fork are located within MSO PACs, consider closing the area to human use during the MSO breeding season (March 1- August 31), or consider limiting human use to 12 or less persons at each site during the breeding season.
5. Monitor MSO use within the Cave Springs PAC in 1999.
6. Establish interpretive signs at trailheads which access West Fork Canyon to assist in educating the public about the sensitivity of the area.

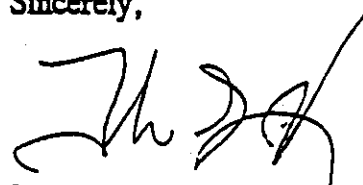
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

## REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the this biological opinion. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The Service appreciates your consideration of threatened and endangered species in amendment development. For further information, please contact Michele James or Bruce Palmer. Please refer to the consultation number 2-21-98-F-209 in future correspondence concerning this project.

Sincerely,

  
for Acting Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM  
Field Supervisor, New Mexico Field Office, Albuquerque, NM  
Forest Biologist, Coconino National Forest, Flagstaff, AZ (Attn: Cecilia Dargan)

Director, Arizona Game and Fish Department, Phoenix, AZ

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